



## Arlington Conservation Commission

**Date:** Thursday, February 3, 2022

**Time:** 7:30 PM

**Location:** Conducted by Remote Participation

Pursuant to State Legislation suspending certain provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the February 3, 2022, public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom. Please note: Not all items listed may in fact be discussed and other items not listed may be brought up for discussion to the extent permitted by law. This agenda includes those matters which can be reasonably anticipated to be discussed at the meeting.

### Agenda

#### 1. Administrative

- a. 7:30 p.m. Please register in advance for this meeting. Reference materials, instructions, and access information for this specific meeting will be available 48 hours prior to the meeting on the Commission's agenda and minutes page.

1. Minutes from January 6, 2022 meeting

2. Vote: Chair and Vice-Chair positions

3. Enforcement actions

The Conservation Agent will update on three recent enforcement actions.

- i. 99 Sunnyside
- ii. 146 Mystic Valley Parkway
- iii. 20 Lafayette Street

4. Discussion: Rodenticide and Integrated Pest Management Warrant Article  
Documents: Rodenticide Warrant Articles

#### 2. Hearings

##### Public Hearings

- 8:30 p.m. **1. Notice of Intent: Hurd Field (Continued)**  
**DEP #091-0337**  
Documents: Hurd Field Response to Comments

This public hearing will consider a Notice of Intent for renovations to Hurd Field located at 0 Massachusetts Avenue and 0 Lowell Street (off Drake Road). Work is proposed to be conducted within the Riverfront Area to Mill Brook, Bordering Land Subject to Flooding (FEMA Zones AE and X, Floodway), the 100-foot Buffer Zone to Bordering Vegetated Wetlands and the Adjacent Upland Resource Areas. Renovation includes regrading and reorienting the athletic fields, upgrading field lighting, and constructing a pedestrian loop path, irrigation system, and other new amenities.

## **2. Notice of Intent: Colonial Village Drive (Continued)**

### **DEP #091-0336**

Documents: Revised Colonial Village Drive Notice of Intent application package, stormwater report, and civil plan set prepared by McKenzie Engineering Group

This public hearing will consider a Notice of Intent to reconstruct all on-site parking and access driveways and curbing, as well as installation of stormwater management systems and conduct site grading at Colonial Village Drive. All work is proposed to be conducted within the 100-foot Buffer Zone to the Inland Bank of a perennial stream that flows from the Arlington Reservoir, the 200-foot Riverfront Area associated with Mill Brook, and Bordering Land Subject to Flooding (FEMA Zone AE).

## **3. Discussion**

### **a. III. Working Session: 1021 – 1025 Massachusetts Avenue (Continued)**

Documents: Site alternate plans 1 and 2, floor plan, exterior rendering, urban park cost estimate, correspondence between Jacquelyn Maggiore (Maggiore) and Katarina Ilic (Millbrook Condominium Association), StormTech stacked system summary

Applicant proposes to demolish two (2) structures and associated driveways, parking lots, and site appurtenances, and construct a 48-unit, 5-story affordable housing condominium building (under Chapter 40B) with ground-level parking garage and retail space. Portions of the proposed project are located within the outer portion of Riverfront Area associated with Mill Brook. Site grading, a retaining wall, erosion controls, invasive species management and native revegetation, establishment of a meadow, and stormwater management are proposed.





## Town of Arlington, Massachusetts

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### Administrative

#### Summary:

7:30 p.m. Please register in advance for this meeting. Reference materials, instructions, and access information for this specific meeting will be available 48 hours prior to the meeting on the Commission's agenda and minutes page.

1. Minutes from January 6, 2022 meeting
2. Vote: Chair and Vice-Chair positions
3. Enforcement actions  
The Conservation Agent will update on three recent enforcement actions.
  - i. 99 Sunnyside
  - ii. 146 Mystic Valley Parkway
  - iii. 20 Lafayette Street
4. Discussion: Rodenticide and Integrated Pest Management Warrant Article  
Documents: Rodenticide Warrant Articles

#### ATTACHMENTS:

	Type	File Name	Description
▢	Reference Material	Rodenticide_Warrant_Articles.pdf	Rodenticide Warrant Articles

**Subject:** Rodenticide - Warrant articles for posting on Novus  
**From:** <s.chapnick@comcast.net>  
**Date:** 2/1/2022, 9:15 AM  
**To:** "'David Morgan'" <dmorgan@town.arlington.ma.us>

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

**CAUTION:** This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "<>" brackets) and you know the content is safe.

## **New ARTICLE I. Phase Out of Certain Toxic Rodenticides on Public/private Property and Reporting/Public Education Provisions**

To see if the Town will vote to amend Title VIII of the Town Bylaws to add a new Article that 1) by January 1, 2024 phases out the use and application of certain rodenticides, including second generation anticoagulant rodenticides (SGARs), either by Town employees or by private contractors on all private and public property in the Town of Arlington except as allowed by the Board of Health to remediate a public health condition; 2) requires all licensed certified applicators of rodenticides to provide written notification to the Board of Health whenever certain rodenticides, including SGARs, are used within the Town; provides for both waivers and penalties for compliance; 3) provides for educating the public about Integrated Pest Management (IPM) best practices and the hazards of rodenticides to human health and the ecosystem during but not limited to licensing, permitting, and inspectional activities; and further establishes such definitions and provisions necessary to effectuate such a bylaw; or take any action related thereto.

**PROPONENT'S STATEMENT: A YES vote on this Article will move the by-law to the Attorney General's Office for review of ALL sections: 1) a phase out of certain toxic rodenticides (e.g, SGARs) that challenges state preemption of local control over local pesticide use (in the spirit of H. Bill 910 An Act Empowering Towns and Cities to Protect Residents and the Environment from Harmful Pesticides (in Committee), 2) the requirement for pesticide applicators to report all use of SGARs within Arlington, and 3) the provision for educating the public on IPM non-toxic alternatives and the hazards of rodenticide. These latter two sections can survive as a town bylaw regardless of the AG's decision about Section 1, since a disallowed Section 1 can be severed from the bylaw leaving the remainder in force.**

## **II. New Article II: Resolution/ Establishing an Integrated Pest Management Policy for Town Land and Public Education about Rodenticide Hazards**

To see if the Town will vote to encourage adoption of a unified Integrated Pest Management (IPM) Policy for the Town that in part prohibits the use of certain rodenticides on Town properties, including second generation anticoagulant rodenticides (SGARs); provides for waivers; provides for educating the public about IPM and rodenticide hazards to human health and the ecosystem; and further establishes such definitions and provisions necessary to effectuate a policy to protect Arlington's citizens, children, wildlife, and ecosystem

*Susan D. Chapnick, M.S.*  
*Chair, Arlington Conservation Commission*  
[s.chapnick@comcast.net](mailto:s.chapnick@comcast.net)



## Town of Arlington, Massachusetts

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### Public Hearings

#### Summary:

8:30 p.m.

#### **1. Notice of Intent: Hurd Field (Continued)**

**DEP #091-0337**

Documents: Hurd Field Response to Comments

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#### **2. Notice of Intent: Colonial Village Drive (Continued)**

**DEP #091-0336**

Documents: Revised Colonial Village Drive Notice of Intent application package, stormwater report, and civil plan set prepared by McKenzie Engineering Group

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#### **ATTACHMENTS:**

Type	File Name	Description
▢ Reference Material	Hurd_Field_-_Response_to_Comments_2022_01_27_full_package.pdf	Hurd Field - Response to Comments
▢ Reference Material	221-155_NOI_-_Revised_1-24-2022.pdf	221-155 NOI - Revised 1-24-2022
▢ Reference Material	221-155_Resubmission_Letter.pdf	221-155 Resubmission Letter
▢ Reference Material	221-155_Stormwater_Report_-_Revised_1-24-2022.pdf	221-155 Stormwater Report - Revised 1-24-2022



Stantec Planning and Landscape Architecture P.C.  
226 Causeway Street, 6th Floor, Boston MA 02114-2171

January 27, 2022  
File: 210801935

**Attention: David Morgan**  
Arlington Conservation Commission  
730 Massachusetts Avenue  
Arlington, Massachusetts 02476

Dear Mr. Morgan,

**Reference: Response to NOI Comments**  
**Town of Arlington Hurd Field Renovation MassDEP File No 091-0337**

On behalf of the Applicant (The Town of Arlington Parks Department), Stantec has reviewed the comments from the Conservation Commission that arose during the Notice of Intent hearing for the above-referenced project on January 20, 2022 and offers responses below. For ease of reading, we have restated the comments followed by our responses below, shown in *italics*. Additional information is provided as an attachment to this memorandum, including the revised plans.

1. Stantec noticed in the Agenda that the MassDEP file number assigned was not noted.

*The MassDEP file number is No. 091-0337.*

2. Mitigation needs to be addressed for impacts in AURA.

*The path along the northwestern side that connects the Minute Man bike path to the Arlington Reservoir has been moved out of the 25' Adjacent Upland Resource Area (AURA). The loop path on the eastern side needed to be partially removed to allow for the change and still have the soccer field size program needed. The path ends in the east before it reaches the 25' AURA. The northern portion of the loop path has been removed. The volume of flood storage is now proposed to be approximately 904 CY more than the existing condition. In addition, the proposed light pole is now out of the 25' AURA. Planting has been added with 18 new trees and a meadow restoration seed mix in the majority of swales, where applicable, as well as the low point/ retention area. Invasive species are prevalent along the edge of the river. The Recreation Department is unable to develop a comprehensive invasive species management plan for this particular project currently as it is*



**Reference: Response to NOI Comments**  
**Town of Arlington Hurd Field Renovation MassDEP File No 091-0337**

*not in the projects budget. Additionally, invasive species management should be addressed comprehensively for the entire area, and not limited to the field.*

*The cut sheets for the seed mixes for the meadow restoration areas are attached. For further details and further discussion of mitigation measures within the 25' AURA and the 200' Riverfront Area information, see attachment "Response to 310 CMR 10.58 (5) Standards for Redevelopment Within the Riverfront Area".*

3. Address consistency with Riverfront Area Redevelopment Standards (310 CMR 10.58 (5))

*Please see attachment for "Response to 310 CMR 10.58 (5) Standards for Redevelopment Within the Riverfront Area".*

4. Additional information on the proposed field lighting needs to be provided.

*A photometric plan and cut-sheets of the field lighting are included as an attachment. Also included is an example of the proposed field lighting system next to an observatory in Connecticut that shows the light cut off technology in modern LED field lighting systems. These fixtures are aimed, which directs the light onto the field and minimizes the amount of light spill outside of the field limits.*

*Note that the project changes resulted in the need to recalculate the temporary and permanent impacts in some of the resource areas. The updated Impact numbers table is included within the Redevelopment Attachment.*

Regards,

**STANTEC CONSULTING SERVICES INC.**



January, 2022  
Page 3 of 3

**Reference: Response to NOI Comments**  
**Town of Arlington Hurd Field Renovation MassDEP File No 091-0337**

Josh Atkinson, RLA  
Landscape Architect  
Phone: (617) 654-6003  
Josh.atkinson@stantec.com

Attachment:

- 1) Revised drawing set labeled "Town of Arlington Hurd Field Renovations Notice of Intent Updates", dated 1/27/2022
- 2) Specification Sheet for New England Conservation/ Wildlife Seed Mix
- 3) Specification Sheet for Low-Growing Meadow Mix
- 4) Response to 310 CMR 10.58 (5) standards for redevelopment within the Riverfront Area)
- 5) Photometric Plan and field lighting cut sheets
- 6) Rendering Site Plan

CC: Joseph Connelly, Recreation Department

MassDEP, Wetlands and Waterways, Northeast Regional Office





# TOWN OF ARLINGTON

## HURD FIELD RENOVATIONS

### NOTICE OF INTENT - UPDATES

ARLINGTON, MA 02476  
PROJECT NO. 210801935

JANUARY 27, 2022

OWNER
TOWN OF ARLINGTON RECREATION DEPARTMENT 422 SUMMER ST. ARLINGTON, MA 02474
LANDSCAPE ARCHITECT/CIVIL ENGINEER
STANTEC PLANNING AND LANDSCAPE ARCHITECTURE 226 CAUSEWAY STREET - FLOOR 6 BOSTON, MA 02114
IRRIGATION DESIGNER
IRRIGATION CONSULTING 20 MERRIT PARKWAY - 2ND FLOOR NASHUA, NH 03062
SURVEYOR
PRECISION LAND SURVEYING, INC. 32 TURNPIKE ROAD SOUTHBOROUGH, MA 01772

PROJECT LOCATION

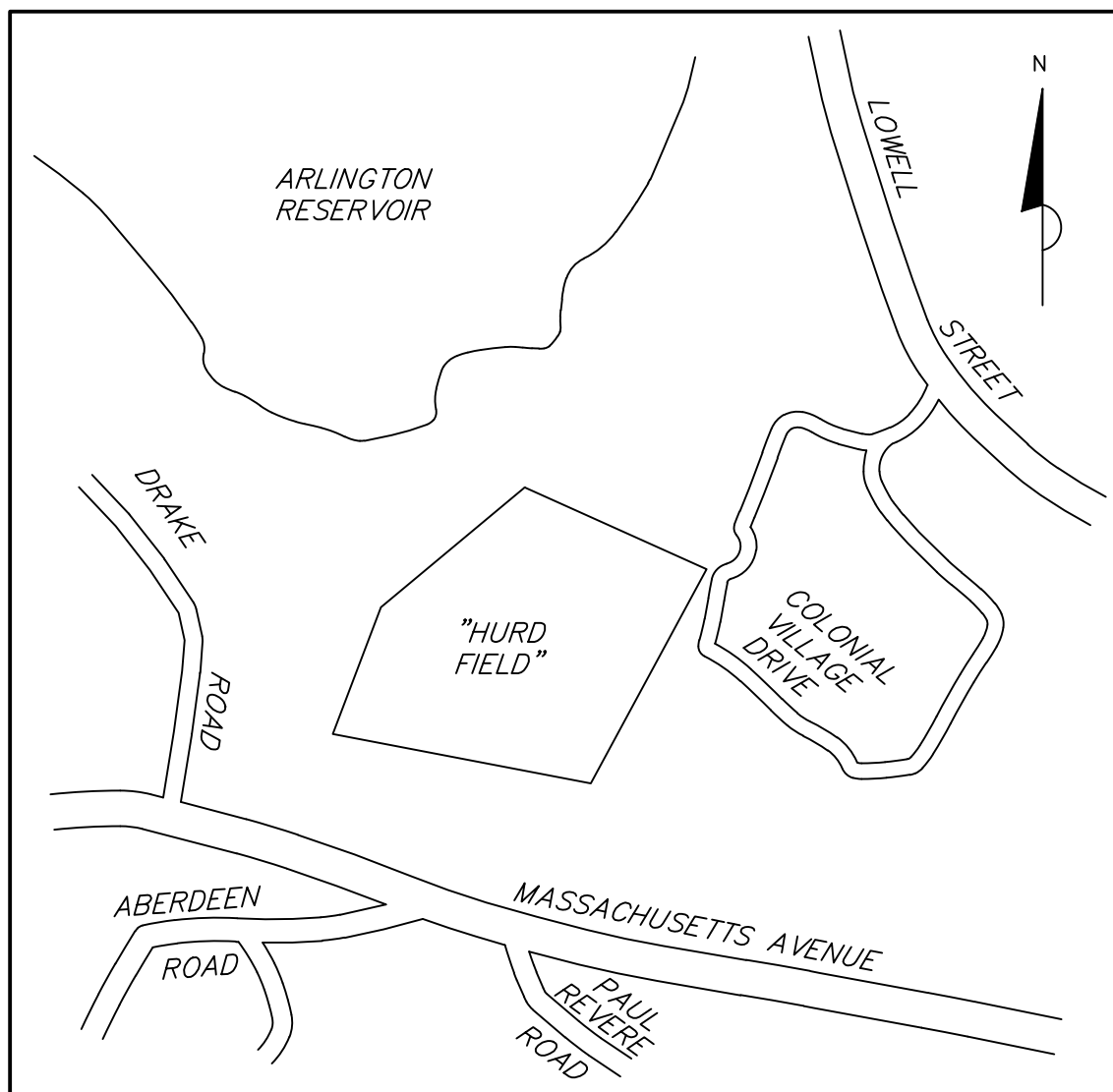


VICINITY MAP  
NOT TO SCALE

#### INDEX OF SHEETS

SHEET NO.	TITLE
	COVER SHEET
EX-1.0	EXISTING CONDITIONS PLAN
L-3	MATERIALS PLAN / PROPOSED WORK
L-4	GRADING AND SEDIMENTATION CONTROL PLAN
L-5	PLANTING PLAN / PROPOSED FINAL CONDITIONS
L-6.1	EROSION AND SEDIMENTATION CONTROL / BMP DETAILS
L-6.2	DETAILS II



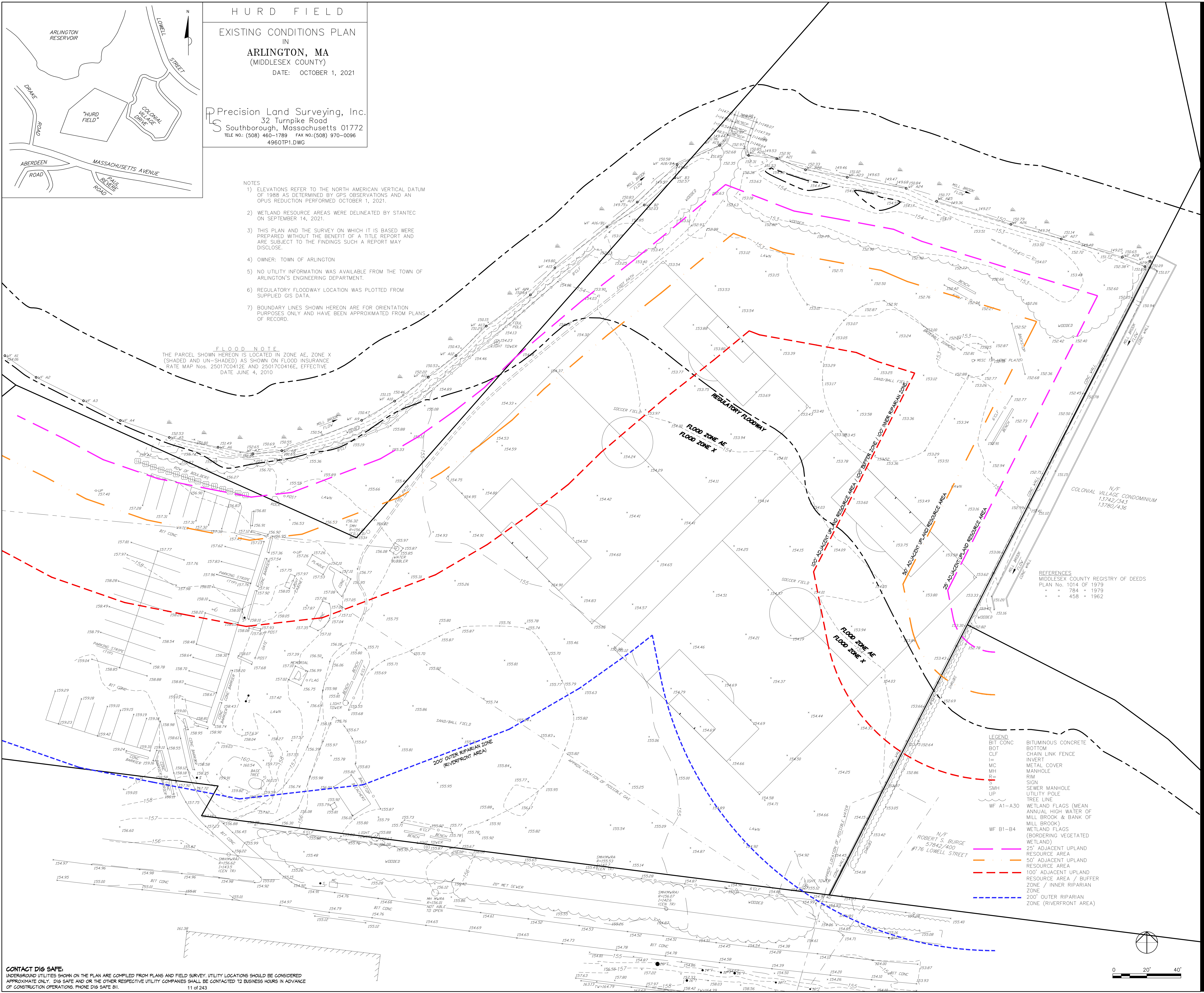


HURD FIELD  
EXISTING CONDITIONS PLAN  
IN  
ARLINGTON, MA  
(MIDDLESEX COUNTY)  
DATE: OCTOBER 1, 2021

Precision Land Surveying, Inc.  
32 Turnpike Road  
Southborough, Massachusetts 01772  
TELE NO.: (508) 460-1789 FAX NO.: (508) 970-0096  
4960TP1.DWG

- NOTES
- 1) ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS DETERMINED BY GPS OBSERVATIONS AND AN OPUS REDUCTION PERFORMED OCTOBER 1, 2021.
  - 2) WETLAND RESOURCE AREAS WERE DELINEATED BY STANTEC ON SEPTEMBER 14, 2021.
  - 3) THIS PLAN AND THE SURVEY ON WHICH IT IS BASED WERE PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND ARE SUBJECT TO THE FINDINGS SUCH A REPORT MAY DISCLOSE.
  - 4) OWNER: TOWN OF ARLINGTON
  - 5) NO UTILITY INFORMATION WAS AVAILABLE FROM THE TOWN OF ARLINGTON'S ENGINEERING DEPARTMENT.
  - 6) REGULATORY FLOODWAY LOCATION WAS PLOTTED FROM SUPPLIED GIS DATA.
  - 7) BOUNDARY LINES SHOWN HEREON ARE FOR ORIENTATION PURPOSES ONLY AND HAVE BEEN APPROXIMATED FROM PLANS OF RECORD.

FLOOD NOTE  
THE PARCEL SHOWN HEREON IS LOCATED IN ZONE AE, ZONE X (SHADED AND UN-SHADED) AS SHOWN ON FLOOD INSURANCE RATE MAP NOS. 25017C0412E AND 25017C0416E, EFFECTIVE DATE JUNE 4, 2010



- LEGEND
- BIT CONC
  - BOT
  - CLF
  - INV
  - MC
  - MH
  - RM
  - SEWER MANHOLE
  - UTILITY POLE
  - TREE LINE
  - WF A1-A30
  - WF B1-B4
  - BITUMINOUS CONCRETE
  - BOTTOM
  - CHAIN LINK FENCE
  - INVERT
  - METAL COVER
  - MANHOLE
  - RIM
  - SEWER MANHOLE
  - UTILITY POLE
  - WETLAND FLAGS (MEAN ANNUAL HIGH WATER OF MILL BROOK & BANK OF MILL BROOK)
  - WETLAND FLAGS (BORDERING VEGETATED WETLAND)
  - 25' ADJACENT UPLAND RESOURCE AREA
  - 50' ADJACENT UPLAND RESOURCE AREA
  - 100' ADJACENT UPLAND RESOURCE AREA / BUFFER ZONE / INNER RIPARIAN ZONE
  - 200' OUTER RIPARIAN ZONE (RIVERFRONT AREA)



LANDSCAPE ARCHITECT -  
PRIME CONSULTANTS  
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226 Causeway Street, 6th Floor  
Boston, MA 02114 U.S.A.  
Tel. 617.523.8103  
Fax. 617.523.4333  
www.stantec.com

IRRIGATION DESIGNER  
Irrigation Consulting  
20 Merritt Parkway - 2nd Floor  
Nashua, NH 03062

CLIENT/OWNER  
Town of Arlington  
Recreation Department  
422 Summer St.  
Arlington, MA 02474

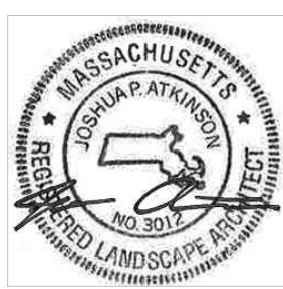
REFERENCES  
MIDDLESEX COUNTY REGISTRY OF DEEDS  
PLAN No. 1014 OF 1979  
" 784 " 1979  
" 458 " 1962

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NOI - Updates		PT	JA	01/27/22
Issued		By	Appd.	MM/DD/YY

File Name: \_\_\_\_\_ Dwn. Chkd. Dgn. MM/DD/YY

Permit-Seal



Client/Project  
TOWN OF ARLINGTON

HURD FIELD RENOVATIONS

Arlington, MA

Title

EXISTING CONDITIONS PLAN

Project No. 210801935  
Sheet 1 of 6

Drawing No. EX-1.0

CONTACT DIS SAFE.  
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIS SAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 12 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIS SAFE BII.

11 of 243



1. EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY PRECISION LAND SURVEYING, INC. 32 TURNPIKE ROAD, SOUTHBOROUGH, MA. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS DETERMINED BY GPS OBSERVATIONS AND AN OPUS REDUCTION PERFORMED OCTOBER 1, 2021.
2. THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN ARE BASED ON THE SURVEY REFERENCED ABOVE. THE CONTRACTOR SHALL NOTIFY DISSEAF AND THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANIES TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. CONTRACTOR(S) SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH ALL CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONDITIONS PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SPECIFICATIONS, AND SITE CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE FOR CLARIFICATION AND RESOLUTION PRIOR TO BIDDING OR CONSTRUCTION.
5. ALL WORK CONDUCTED WITHIN PUBLIC RIGHT-OF-WAYS SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE TOWN OF ARLINGTON AND THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT).
6. ACCESSIBLE CURB RAMPS SHALL BE PER THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) AND THE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES, WHICHEVER IS MORE STRINGENT.
7. SCREENED IMAGES SHOW EXISTING CONDITIONS. WHERE EXISTING CONDITIONS LIE UNDER OR ARE IMPINGED UPON BY PROPOSED BUILDINGS AND/OR SITE ELEMENTS, THE EXISTING CONDITION WILL BE REMOVED, ABANDONED AND/OR CAFFEED OR DEMOLISHED AS REQUIRED.
8. ALL NEWLY SODDED AREAS WITHIN LIMIT OF WORK TO BE IRRIGATED. CONTRACTOR SHALL COORDINATE WITH TOWN TO VERIFY LOCATIONS OF EXISTING IRRIGATION MAIN.

PROPERTY LINE

LIMIT OF WORK

ATHLETIC LIGHT POLE

POROUS ASPHALT

MEMORIAL PLAQUE

CHAIN LINK FENCE (CLF)

BACKSTOP

BENCH

PICNIC TABLE

BOTTLE FILL STATION

FLAG POLE

BOLLARD

BIKE RACK

GUARD RAIL

TRASH AND RECYCLING RECEPTACLES

25' ADJACENT UPLAND RESOURCE AREA

50' ADJACENT UPLAND RESOURCE AREA

100' ADJACENT UPLAND RESOURCE AREA / 100' BUFFER ZONE / 100' INNER RIPARIAN ZONE

200' OUTER RIPARIAN ZONE (RIVERFRONT AREA)

**CONTACT DIG SAFE:**  
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIG SAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 12 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIG SAFE 811.



CLIENT/OWNER  
Town of Arlington  
Recreation Department  
422 Summer St.  
Arlington, MA 02474

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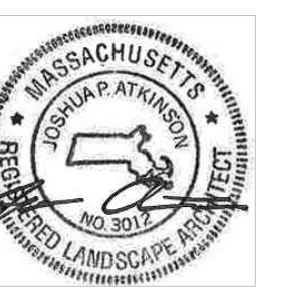
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[illegible]

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Issued	By	Appd.	MM.DD.YY

File Name: \_\_\_\_\_ Dwn. \_\_\_\_\_ Chkd. \_\_\_\_\_ Dsxn. \_\_\_\_\_ MM.DD.YY \_\_\_\_\_



Client/Project  
TOWN OF ARLINGTON

HURD FIELD RENOVATIONS

Arlington, MA

Title

MATERIALS PLAN / PROPOSED WORK

Project No. 1" = 20'  
Scale

Sheet \_\_\_\_\_ Drawing No. \_\_\_\_\_



GRADING LEGEND

- PROPERTY LINE
- LIMIT OF WORK LINE
- 110 PROPOSED CONTOUR MAJOR LINE
- 112 PROPOSED CONTOUR MINOR LINE
- +(133.00) EXISTING SPOTGRADE
- +133.00 PROPOSED SPOTGRADE
- X X TEMPORARY CONSTRUCTION FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- SEDIMENTATION CONTROL
- W 2" COPPER PIPE
- 25' ADJACENT UPLAND RESOURCE AREA
- 50' ADJACENT UPLAND RESOURCE AREA
- 100' ADJACENT UPLAND RESOURCE AREA / 100' BUFFER ZONE / 100' INNER RIPARIAN ZONE
- 200' OUTER RIPARIAN ZONE (RIVERFRONT AREA)

GRADING NOTES

- EXISTING CONDITIONS INFORMATION IS REPRODUCED FROM THE SURVEY PREPARED BY PRECISION LAND SURVEYING, INC. 32 TURNPIKE ROAD, SOUTHBOROUGH, MA. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 AS DETERMINED BY GPS OBSERVATIONS AND AN OPUS REDUCTION PERFORMED OCTOBER 1, 2021.
- PRIOR TO THE START OF ANY EXCAVATION FOR THE PROJECT, BOTH ON AND OFF THE SITE, THE CONTRACTOR SHALL NOTIFY DIGSAFE AND BE PROVIDED WITH A DIGSAFE NUMBER INDICATING THAT ALL EXISTING UTILITIES HAVE BEEN LOCATED AND MARKED.
- WHERE PROPOSED GRADES MEET EXISTING GRADES, CONTRACTOR SHALL BLEND GRADES TO PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING AND NEW WORK. PONDING AT TRANSITION AREAS WILL NOT BE ALLOWED.
- CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDING FOUNDATIONS, STRUCTURES AND PLANTING BEDS.
- MAXIMUM SLOPE IN DISTURBED AREAS SHALL NOT EXCEED 3:1, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL MEET THE REQUIREMENTS OF 521 CMR OF THE ARCHITECTURAL ACCESS BOARD REGULATIONS. ALL GRADES ON WALKWAYS, RAMPS, CURB CUTS AND PARKING AREAS AS DEFINED BY 521 CMR SHALL COMPLY WITH THE MAXIMUM ALLOWABLE GRADES. GRADES SHALL BE MEASURED AT TWO FOOT INTERVALS. CROSS SLOPES ON ALL WALKS, PATHS OF TRAVEL AND ACCESSIBLE ROUTES AS DEFINED IN 521 CMR SHALL NOT EXCEED 1:5%. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY IF DISCREPANCIES ARISE BETWEEN THE ACTUAL GRADES SHOWN ON THE PLANS AND THE MAXIMUM ALLOWABLE GRADES INDICATED IN 521 CMR.
- ALL WALKWAYS SHALL BE GRADED TO A MAXIMUM 4:5% RUNNING SLOPE (PARALLEL TO THE DIRECTION OF TRAVEL). THE CROSS PITCH OF ALL WALKWAYS, PATHS AND PLAZAS SHALL NOT EXCEED 1:5% (PERPENDICULAR TO THE DIRECTION OF TRAVEL). THE SLOPE OF ALL RAMPS AND SIDE SLOPES OF HANDICAP CURB CUTS AS DEFINED BY SECTION 21.1 OF 521 CMR SHALL BE CONSTRUCTED AT 1:5% MAXIMUM. RAMPS AS DEFINED IN SECTION 24.1 OF 521 CMR SHALL BE CONSTRUCTED TO A MAXIMUM SLOPE OF 1:5%.
- ENSURE ALL EXISTING (TO REMAIN), AND PROPOSED MANHOLE COVERS PROPERLY IDENTIFY UTILITY SERVICED.
- CONTRACTOR SHALL VERIFY EXISTING GRADES AND NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
- BITUMINOUS CONCRETE ELEVATIONS AT CATCH BASINS TO BE 1/4 INCH ABOVE RIM ELEVATION SHOWN FOR CATCH.
- CONTRACTOR TO ADJUST UTILITY ELEMENT MEANT TO BE FLUSH WITH GRADE (CLEAN-OUTS, UTILITY MANHOLES, CATCH BASINS, INLETS ETC.) THAT IS AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT.
- SCREENED IMAGES SHOW EXISTING CONDITIONS. WHERE EXISTING CONDITIONS LIE UNDER OR ARE IMPOSED UPON BY PROPOSED BUILDINGS AND/OR SITE ELEMENTS, THE EXISTING CONDITION WILL



LANDSCAPE ARCHITECT -  
PRIME CONSULTANTS  
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IRRIGATION DESIGNER  
Irrigation Consulting  
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Nashua, NH 03062

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422 Summer St.  
Arlington, MA 02474

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NOI - Updates  
Issued

File Name: Dwn. Chkd. Dgn. MWD.D.Y.

Permit-Seal



Client/Project  
TOWN OF ARLINGTON

HURD FIELD RENOVATIONS

Arlington, MA

Title  
GRADING AND SEDIMENTATION  
CONTROL PLAN

Project No.  
210801935

1" = 20'  
Scale

Sheet

Drawing No.



PLANTING LEGEND

- EXISTING TREE
- DECIDUOUS TREE
- ORNAMENTAL TREE
- MEADOW RESTORATION MIX (SEED)
- ATHLETIC FIELD CONSTRUCTION (SOD)
- SEEDED LAWN
- LIMIT OF WORK
- 25' ADJACENT UPLAND RESOURCE AREA
- 50' ADJACENT UPLAND RESOURCE AREA
- 100' ADJACENT UPLAND RESOURCE AREA / 100' BUFFER
- ZONE / 100' INNER RIPARIAN ZONE
- 200' OUTER RIPARIAN ZONE (RIVERFRONT AREA)

PLANT SCHEDULE

DECIDUOUS TREES				
SYM	QTY	BOTANICAL NAME	COMMON NAME	SIZE
NS	3	NYSSA SYLVATICA	BLACK GUM	3-3.5" CAL.
QA	4	QUERUS ALBA	WHITE OAK	3-3.5" CAL.
QC	3	QUERUS COCCINEA	SCARLET OAK	3-3.5" CAL.

ORNAMENTAL TREES				
SYM	QTY	BOTANICAL NAME	COMMON NAME	SIZE
BN	3	BETULA NIGRA	RIVER BIRCH	3-3.5" CAL.
CC	5	CERCIS CANADENSIS	REDBUD	3-3.5" CAL.



LANDSCAPE ARCHITECT -  
PRIME CONSULTANTS  
Stantec Planning and  
Landscape Architecture P.C.  
226 Causeway Street, 6th Floor  
Boston, MA 02114 U.S.A.  
Tel. 617.523.8103  
Fax. 617.523.4333  
www.stantec.com

IRRIGATION DESIGNER  
Irrigation Consulting  
20 Merritt Parkway - 2nd Floor  
Nashua, NH 03062

CLIENT/OWNER  
Town of Arlington  
Recreation Department  
422 Summer St.  
Arlington, MA 02474

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The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

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NOI - Updates  
Issued

Permit-Seal



Client/Project  
TOWN OF ARLINGTON

HURD FIELD RENOVATIONS

Arlington, MA

Title  
PLANTING PLAN / PROPOSED FINAL  
CONDITIONS

Project No.  
210801935

Sheet  
4

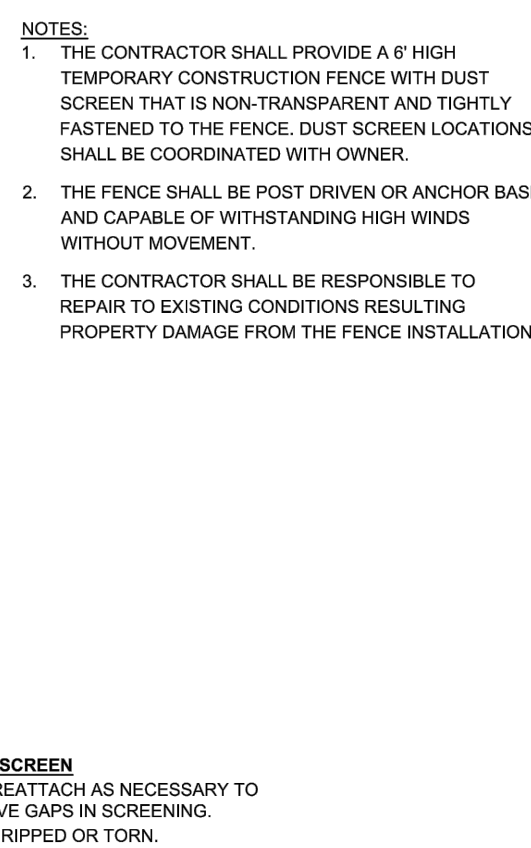
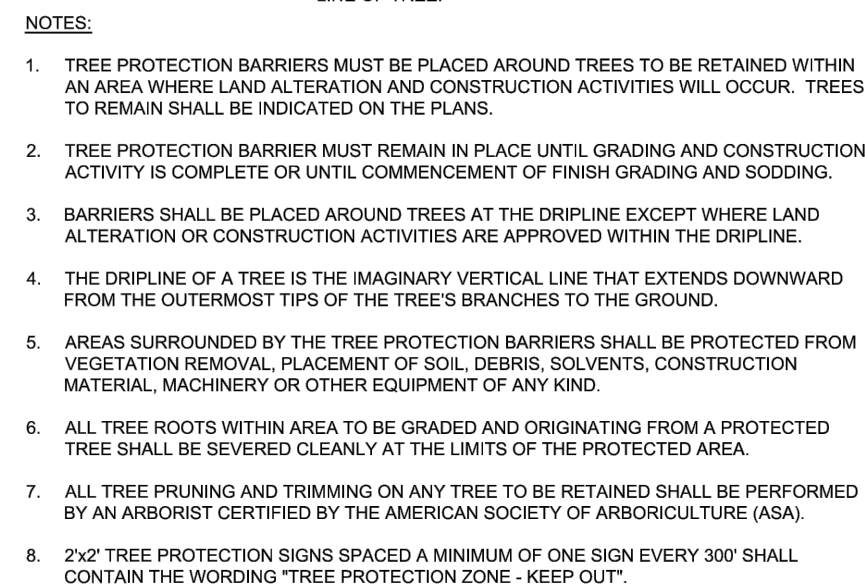
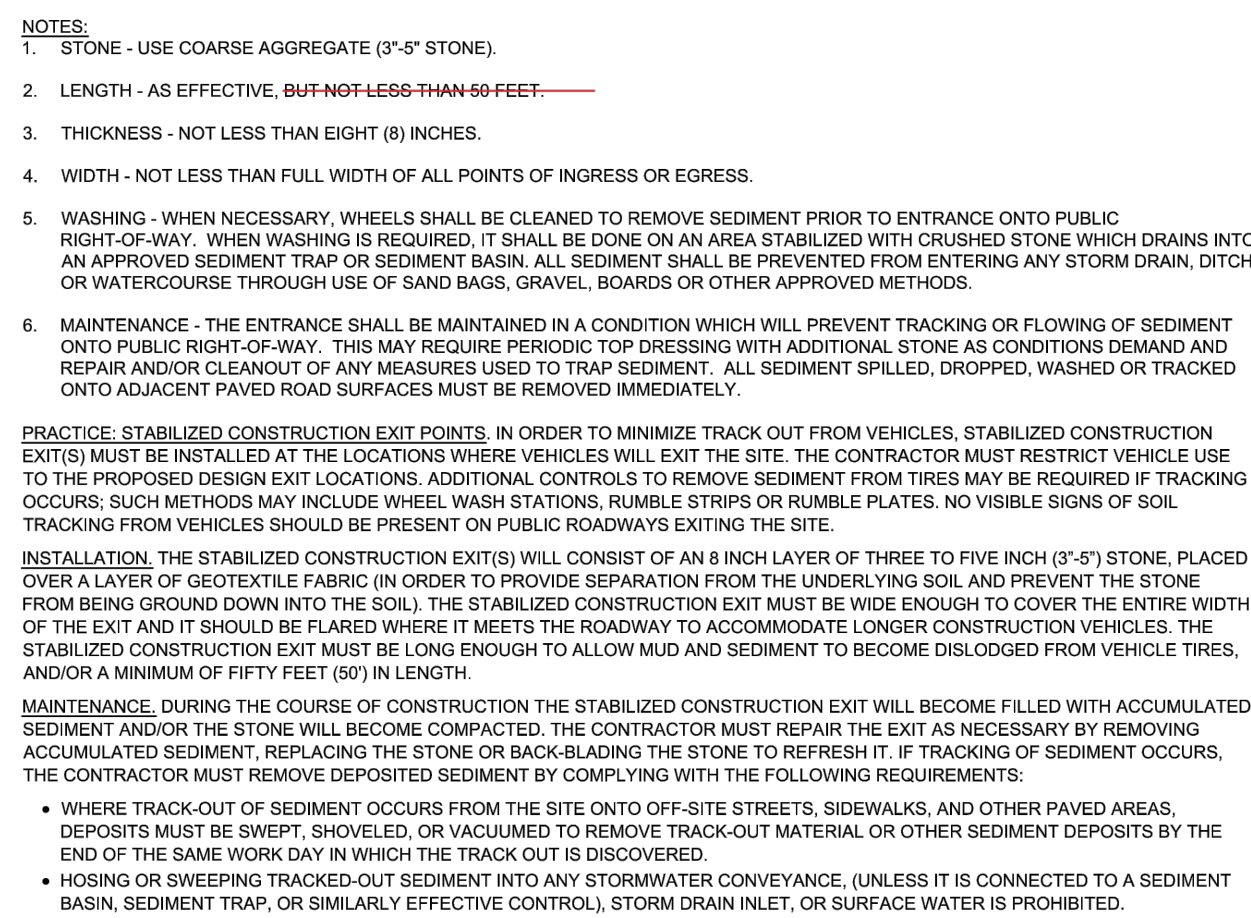
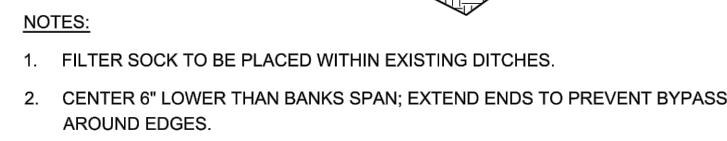
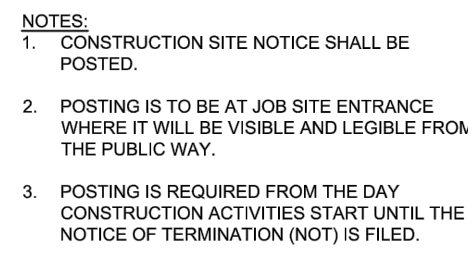
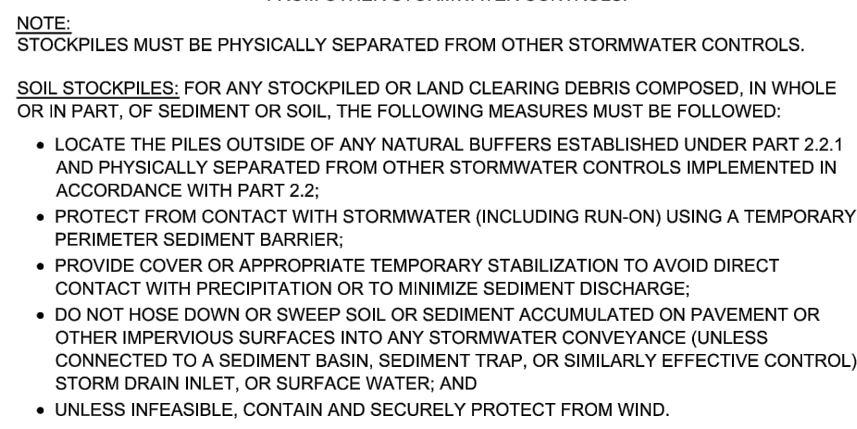
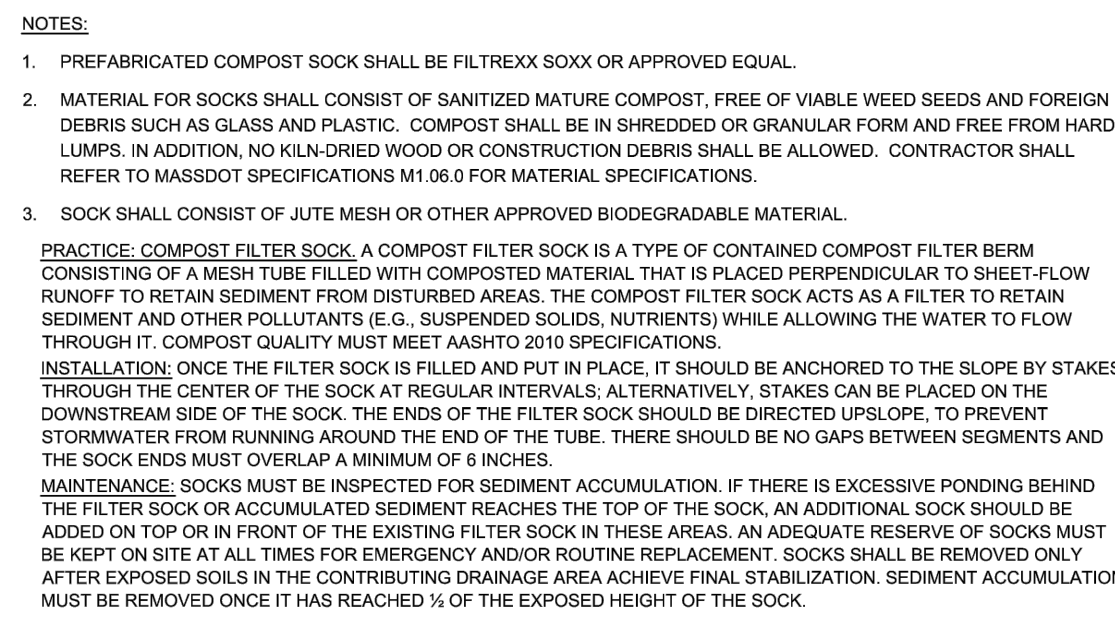
1" = 20'  
Scale

Drawing No.  
L-5

CONTACT DIS SAFE.  
UNDERGROUND UTILITIES SHOWN ON THE PLAN ARE COMPILED FROM PLANS AND FIELD SURVEY. UTILITY LOCATIONS SHOULD BE CONSIDERED APPROXIMATE ONLY. DIS SAFE AND OR THE OTHER RESPECTIVE UTILITY COMPANIES SHALL BE CONTACTED 12 BUSINESS HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS. PHONE DIS SAFE 811.

14 of 243



[illegible]

HURD FIELD RENOVATIONS

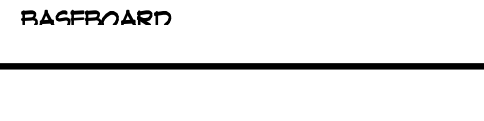
Arlington, MA

## EROSION AND SEDIMENTATION CONTROL / BMP DETAILS

Project No.	Scale	
210801935		
Sheet		Drawing No.

5 of 6 L-6.1





6 of 6 L-6.2



# **NEW ENGLAND WETLAND PLANTS, INC**

820 WEST STREET, AMHERST, MA 01002

PHONE: 413-548-8000 FAX 413-549-4000

EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

## **New England Conservation/Wildlife Mix**

Botanical Name	Common Name	Indicator
<i>Elymus virginicus</i>	Virginia Wild Rye	FACW-
<i>Schizachyrium scoparium</i>	Little Bluestem	FACU
<i>Andropogon gerardii</i>	Big Bluestem	FAC
<i>Festuca rubra</i>	Red Fescue	FACU
<i>Sorghastrum nutans</i>	Indian Grass	UPL
<i>Panicum virgatum</i>	Switch Grass	FAC
<i>Chamaecrista fasciculata</i>	Partridge Pea	FACU
<i>Desmodium canadense</i>	Showy Tick Trefoil	FAC
<i>Asclepias tuberosa</i>	Butterfly Milkweed	NI
<i>Bidens frondosa</i>	Beggar Ticks	FACW
<i>Eupatorium purpureum (Eutrochium maculatum)</i>	Purple Joe Pye Weed	FAC
<i>Rudbeckia hirta</i>	Black Eyed Susan	FACU-
<i>Aster pilosus (Symphyotrichum pilosum)</i>	Heath (or Hairy) Aster	UPL
<i>Solidago juncea</i>	Early Goldenrod	

PRICE PER LB. \$39.50 MIN. QUANTITY 2 LBS. TOTAL: \$79.00 APPLY: 25 LBS/ACRE :1750 sq ft/lb

The New England Conservation/Wildlife Mix provides a permanent cover of grasses, wildflowers, and legumes For both good erosion control and wildlife habitat value. The mix is designed to be a no maintenance seeding, and is appropriate for cut and fill slopes, detention basin side slopes, and disturbed areas adjacent to commercial and residential projects.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is \$/bulk pound, FOB warehouse, Plus SH and applicable taxes.

[BACK TO SHOPPING](#)





# Low-Growing Meadow for Medium Soils

A Low Growing Meadow is ideal in a variety of situations, and this seed mix is perfect for urban and suburban landscapes with medium loam to clay soils. The majority of the flowers are no taller than two to three feet high, with only a few rising ...

More Detail

Quantity	Price Ea.	▼
1/4 Lb	\$95.00	
1/2 Lb	\$190.00	
1-2 Lb	\$265.00	
3-4 Lb	\$208.33	
5-9 Lb	\$187.00	
10+ Lb	\$169.50	

Select Weight



1



ADD TO CART

Add to Wish List

## Cultural Details

Soil Type	Clay, Loam, Sand
Soil Moisture	Medium
Sun Exposure	Full Sun
Height	1' - 4'
Seeding Rate	10 Lbs per Acre or 1/4 Lb per 1000 Sq Ft.

## Description



## Shipping



## Components



### Wildflowers

Lavender Hyssop

Nodding Pink Onion

Butterfly Weed

Sky Blue Aster

Smooth Aster

Lanceleaf Coreopsis

White Prairie Clover

Purple Prairie Clover

Shootingstar

Purple Coneflower

Prairie Blazing Star

Wild Quinine

Smooth Penstemon

Black Eyed Susan

Ohio Goldenrod

Stiff Goldenrod

Showy Goldenrod

Ohio Spiderwort

Golden Alexanders

**Grasses Sedges**

Sideoats Grama

Little Bluestem

Prairie Dropseed



Stantec Planning and Landscape Architecture P.C.  
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**Reference:**

**Response to Comments Town of Arlington Hurd Field Renovation MassDEP File  
No 091-0337**

## **Response To 310 CMR 10.58 (5) Standards for Redevelopment Within the Riverfront Area**

**Comment #3:** Address consistency with Riverfront Area Redevelopment Standards (310 CMR 10.58 (5))

WPA Criteria 310 CMR 10.58 (5): Within Previously Developed Riverfront Areas; Restoration and Mitigation. Notwithstanding the provisions of 310 CMR 10.58(4)(c) and (d), the issuing authority may allow work to redevelop a previously developed riverfront area, provided the proposed work improves existing conditions. Work to redevelop previously developed riverfront areas shall conform to the following criteria (a) through (h).

(a) At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40. When a lot is previously developed but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58(4) shall be met.

**Conformance:**

Flood control: this interest will be improved by the creation of additional flood storage capacity by lowering elevation of the existing grades within the flood zone. The grades will be lowered by approximately 0.5 feet and result in a net increase in flood storage capacity on the parcel by creating additional volume below elevation 154 feet. A section of the pedestrian path will also be located within BLSF however, it is designed to match existing grades or slightly lower in elevation. Therefore, the pedestrian path will not result in a loss of flood storage capacity. Overall, the Project will increase flood volume storage in the BLSF by 24,408 CF (904 CY).

Protection of wildlife habitat and prevention of pollution: This interest will be improved as there are mitigation measures proposed that will provide an increase in the wildlife habitat value of the area. The existing grassed areas between the path and wooded riparian corridor on the west and east sides of the fields will be seeded with a New England Conservation/Wildlife Mix (see attached specification sheets).

The introduction of the seed mix, which includes a permanent cover of grasses, wildflowers and legumes will enhance wildlife habitat values and provide erosion control. In addition, a corridor of trees will be planted within the 25-foot AURA no disturb zone (Bylaw) and inner and outer riparian zones between the parking lot and reservoir. The tree planting area is approximately 6,033 sf of area that is



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Reference:  
Response to Comments Town of Arlington Hurd Field Renovation MassDEP File  
No 091-0337

currently grass, eroded area or field. There are 18 trees proposed, all of which will provide a significant benefit to wildlife species in the area including shade, nesting habitat, food resources and cover, as presented in Table 1.

**Table 1: Wildlife Value of Proposed Trees**

Common Name	Latin Name	Number of Trees	Wildlife Habitat Value
River Birch	<i>Betula nigra</i>	3	<ul style="list-style-type: none"><li>• White-tailed deer browsing</li><li>• Potential nesting sites for waterfowl</li><li>• Food and cover for many animals</li></ul>
Black Gum	<i>Nyssa sylvatica</i>	3	<ul style="list-style-type: none"><li>• Fruits are a food source for Turkeys, robins, woodpeckers, thrushes, flickers and many other species</li><li>• Flowers attract bees</li></ul>
Scarlet Oak	<i>Quercus coccinea</i>	3	<ul style="list-style-type: none"><li>• Acorns are food source for upland wildlife species: squirrels, chipmunks, blue jays, woodpeckers</li><li>• Nesting sites for small mammals and birds in the canopy while the tree is alive and, in the cavity, after it dies</li></ul>
White Oak	<i>Quercus Alba</i>	4	<ul style="list-style-type: none"><li>• Acorns are food source for upland wildlife species: squirrels, chipmunks, blue jays, woodpeckers</li><li>• Nesting sites for small mammals and birds in the canopy while the tree is alive and, in the cavity, after it dies</li></ul>
Red Bud	<i>Cercis canadensis</i>	5	<ul style="list-style-type: none"><li>• Seeds and pods source of food for goldfinch, deer</li><li>• Deer browse seedlings</li><li>• Early blossoms attract nectar-seeking insects, including early-season butterflies</li><li>• Seeds are a food source for chickadees and northern bobwhite</li></ul>



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Reference:  
Response to Comments Town of Arlington Hurd Field Renovation MassDEP File  
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			<ul style="list-style-type: none"><li>• Nesting site and source of nesting materials for birds and mammals</li></ul>
--	--	--	--

Protection of public/private water supply, storm damage prevention, ground water supply, land containing shellfish and protection of fisheries are not applicable.

(b) Stormwater management is provided according to standards established by the Department.

**Conformance:** Stormwater management is designed to alleviate existing low points and shed/direct water to the field exterior where it will be collected in vegetated swales and conveyed to the infiltration basin along the northern portion of the site. The proposed regrading represents a benefit to the overall stormwater management on the site and increases the volume by 24,408 cf.

(c) Within 200- foot riverfront areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25 foot riverfront areas, except in accordance with 310 CMR 10.58(5)(f) or (g).

**Conformance:** The proposed work within the RFA includes reestablishing the existing pedestrian pathway.

The path along the west side of the fields will be within the same alignment as the existing path and/or slightly closer to the river. Compared to the previous design, the majority of the path to the east and north of the fields has been shortened and/or eliminated in the proposed re-design. A short section of path to the east will remain in riverfront area to provide ADA compliant access to the eastern most field. A section of the path on north will be eliminated with exception of connection to existing path over the river and to the reservoir. See attached revised plan set.

(d) Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).

**Conformance:** The project elements within the RFA include the above referenced path segments, the shed and overlook. These components are integral to the field layout and intrusion has been minimized to the extent practicable considering location practicality.



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(e) The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).

**Conformance:** The updated layout resulted in a reduction of impervious surface within the RFA. On the field parcel, the percentage of existing and proposed degraded areas will remain the same at 18.4% of the total RRA on the parcel. On the North parcel, the amount of impervious surface will increase by 116 sf or 0.1% increase of the total degraded RFA on the parcel. We consider this nominal increase to be *de minimis* and will accommodate public ADA compliant access to an existing path. The updated RFA calculations are represented in the following table in red.

	Existing Degraded RFA	Proposed Alteration Inner Riparian		Proposed Alteration Outer Riparian		Proposed New Degraded RFA
	Field Parcel 0 Massachusetts Avenue					
TOTAL RFA on Parcel =	40,506sf/18.4%	Temp	Perm	Temp	Perm	+2,315 sf  -67 sf
220,484 square feet (sf)		62,432 sf	7,399 sf 7,537 sf	63,741 sf	9,819 sf 7,299 sf	40,506 sf + 2,315 sf = 42,821 sf/19.4% 40,506 sf - 67 sf = 40,439 sf/18.4%
	North Parcel 0 Lowell Street					
TOTAL RFA on Parcel =	17,254sf/12.3%	Temp	Perm	Temp	Perm	+582 sf  +116 sf



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Reference:  
Response to Comments Town of Arlington Hurd Field Renovation MassDEP File  
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140,206 square feet (sf)		2,933 sf	582 sf 116 sf	0 sf	0 sf	17,254 sf + 582 sf = 17,86 sf/12.7%  17,254 sf + 116 sf = 17,370 sf/12.4%
--------------------------------	--	----------	------------------	------	------	---

(f) When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river shall be selected for restoration. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Restoration shall include: 1. removal of all debris but retaining any trees or other mature vegetation; 2. grading to a topography which reduces runoff and increases infiltration; 3. coverage by topsoil at a depth consistent with natural conditions at the site; and 4. seeding and planting with an erosion control seed mixture, followed by plantings of herbaceous and woody species appropriate to the site.

**Conformance:** Areas within the Riverfront Area have been selected for plantings and seed mix enhancements. See g. below for on-site mitigation and site enhancements.

(g) When an applicant proposes mitigation either on-site or in the riverfront area within the same general area of the river basin, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), or (e) at a ratio in square feet of at least 2:1 of mitigation area to area of alteration not conforming to the criteria or an equivalent level of environmental protection where square footage is not a relevant measure. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Mitigation may include off-site restoration of riverfront areas, conservation restrictions under M.G.L. c. 184, §§ 31 through 33 to preserve undisturbed riverfront areas that could be otherwise altered under 310 CMR 10.00, the purchase of development rights within the riverfront area, the restoration of bordering vegetated wetland, projects to remedy an existing adverse





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**Reference:**

**Response to Comments Town of Arlington Hurd Field Renovation MassDEP File No 091-0337**

impact on the interests identified in M.G.L. c. 131, § 40 for which the applicant is not legally responsible, or similar activities undertaken voluntarily by the applicant which will support a determination by the issuing authority of no significant adverse impact. Preference shall be given to potential mitigation projects, if any, identified in a River Basin Plan approved by the Secretary of the Executive Office of Energy and Environmental Affairs.

**Conformance:** Although the project will result in a slight increase in degraded RFA (116 sf) the applicant will be providing mitigation in the form of seeding with native wildlife/meadow mix and tree plantings within the RFA. The proposed mitigation measures represent greater than a 2:1 ratio. The mitigation and enhancements include 6,033 sf of area that will be designated for wildlife-habitat enhancing tree planting and a 12,200 sf area of wildlife and erosion control seed mix. Additionally, the stormwater management improvements include a floodplain capacity volume increase of 24,408 CF (904 CY) in the Riverfront Area. See the explanation and details of proposed mitigation provided in section (a) of this document.

(h) The issuing authority shall include a continuing condition in the Certificate of Compliance for projects under 310 CMR 10.58(5)(f) or (g) prohibiting further alteration within the restoration or mitigation area, except as may be required to maintain the area in its restored or mitigated condition. Prior to requesting the issuance of the Certificate of Compliance, the applicant shall demonstrate the restoration or mitigation has been successfully completed for at least two growing seasons.

**Conformance:** Applicant will monitor and demonstrate successful restoration for at least two growing seasons.

Hurd Soccer Field  
Arlington, MA

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1-A2	60'	60'	2	TLC-LED-600	1.16 kW	A
		60'	1	TLC-LED-900	0.89 kW	A
		16'	1	TLC-BT-575	0.58 kW	A
B1-B2	60'	60'	5	TLC-LED-900	4.45 kW	A
		16'	1	TLC-BT-575	0.58 kW	A
C1-C2	80'	80'	5	TLC-LED-1200	5.85 kW	A
UP1-UP2	35'	35'	1	TLC-LED-400	0.40 kW	B
8			32		27.80 kW	

Circuit Summary			
Circuit	Description	Load	Fixture Qty
A	Softball	27.0 kW	30
B	Parking	0.8 kW	2

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-600	LED 5700K - 75 CRI	580W	65,600	>120,000	>120,000	>120,000	4
TLC-LED-400	LED 5700K - 75 CRI	400W	46,500	>120,000	>120,000	>120,000	2
TLC-LED-1200	LED 5700K - 75 CRI	1170W	136,000	>120,000	>120,000	>120,000	10
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>120,000	>120,000	>120,000	12
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>120,000	>120,000	>120,000	4

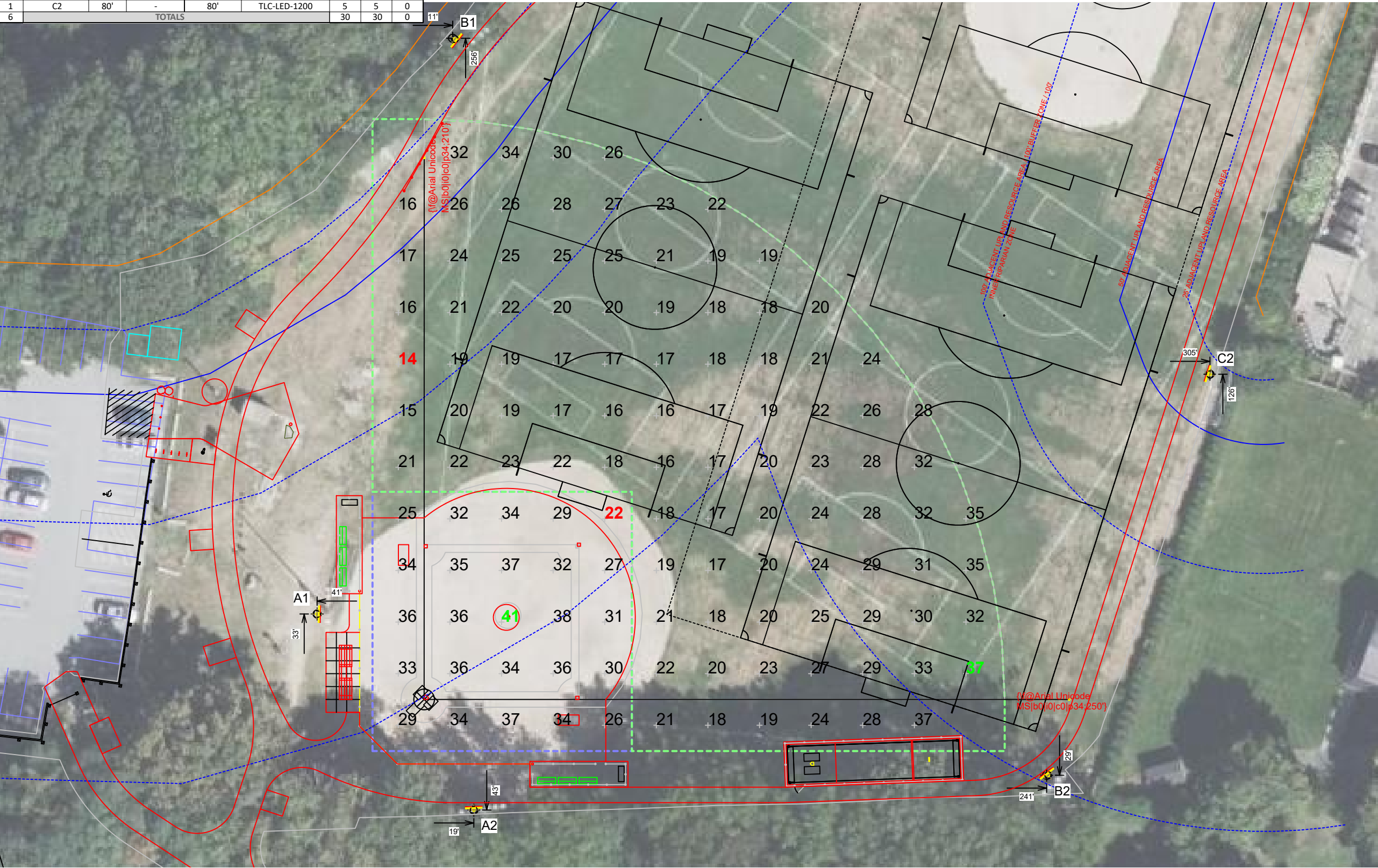
Light Level Summary

Calculation Grid Summary								
Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
150' Spill Line (Cd)	Max Candela (by Fixture)	4618	45.2	16902	373.83	102.14	A	30
150' Spill Line	Horizontal	0.02	0	0.06	0.00		A	30
150' Spill Line	Max Vertical Illuminance Metric	0.08	0	0.19	309.52		A	30
Overall Area	Horizontal	23	5	40	7.59	4.60	A	30
Parking	Horizontal	2.80	0	17	78188.63		B	2
Softball (Infield)	Horizontal Illuminance	32.7	22	41	1.84	1.49	A	30
Softball (Outfield)	Horizontal Illuminance	22.8	14	37	2.72	1.63	A	30
Zero Grid	Horizontal Illuminance	8.53	0	41	13738.47		A	30

From Hometown to Professional



EQUIPMENT LIST FOR AREAS SHOWN									
Pole				Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS	
2	A1-A2	60'	-	60'	TLC-LED-900	1	1	0	
				15.5'	TLC-BT-575	1	1	0	
				60'	TLC-LED-600	2	2	0	
2	B1-B2	60'	-	15.5'	TLC-BT-575	1	1	0	
				60'	TLC-LED-900	5	5	0	
				80'	TLC-LED-1200	5	5	0	
1	C1	80'	-	80'	TLC-LED-1200	5	5	0	
1	C2	80'	-	80'	TLC-LED-1200	5	5	0	
6	TOTALS					30	30	0	



Hurd Soccer Field

Arlington, MA

GRID SUMMARY	
Name:	Softball
Size:	225'/225'/225' - basepath 60'
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY		
MAINTAINED HORIZONTAL FOOTCANDLES		
	Infield	Outfield
Guaranteed Average:	30	20
Scan Average:	32.69	22.81
Maximum:	41	37
Minimum:	22	14
Avg / Min:	1.48	1.67
Guaranteed Max / Min:	2.5	3
Max / Min:	1.84	2.72
UG (adjacent pts):	1.37	1.59
CU:	0.39	
No. of Points:	25	94
LUMINAIRE INFORMATION		
Applied Circuits:	A	
No. of Luminaires:	30	
Total Load:	27.0 kW	

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



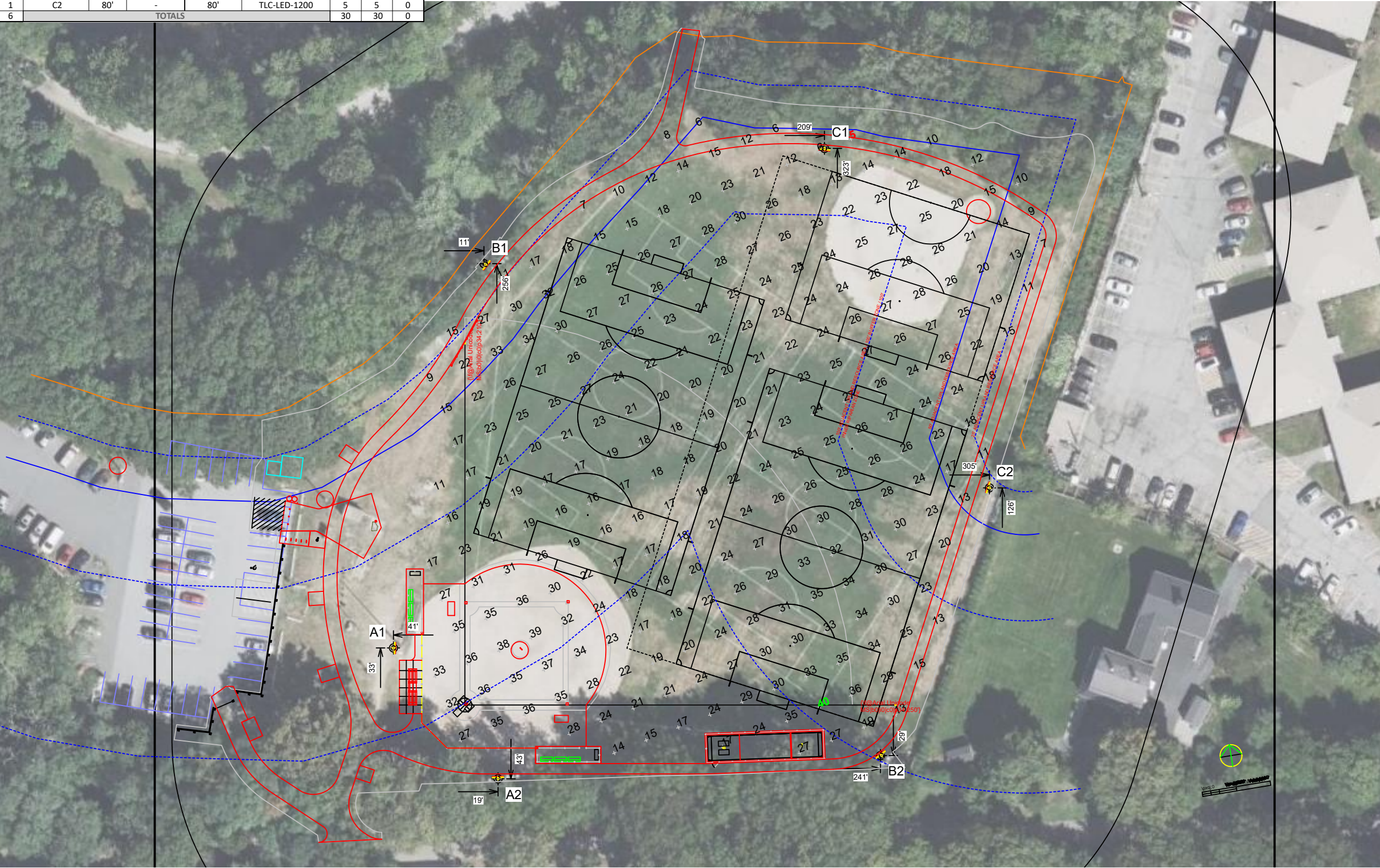
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ILLUMINATION SUMMARY



EQUIPMENT LIST FOR AREAS SHOWN									
Pole				Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS	
2	A1-A2	60'	-	60'	TLC-LED-900	1	1	0	
				15.5'	TLC-BT-575	1	1	0	
				60'	TLC-LED-600	2	2	0	
				15.5'	TLC-BT-575	1	1	0	
2	B1-B2	60'	-	60'	TLC-LED-900	5	5	0	
1	C1	80'	-	80'	TLC-LED-1200	5	5	0	
1	C2	80'	-	80'	TLC-LED-1200	5	5	0	
6	TOTALS					30	30	0	



## Hurd Soccer Field

Arlington, MA

### GRID SUMMARY

Name:	Overall Area
Size:	225'/225'/225' - basepath 60'
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

### ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	23.00
Maximum:	40
Minimum:	5
Avg / Min:	4.41
Max / Min:	7.59
UG (adjacent pts):	2.78
CU:	0.83
No. of Points:	271

#### LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	30
Total Load:	27.0 kW

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

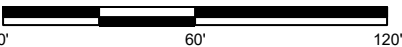
**Installation Requirements:** Results assume  $\pm 3\%$  nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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### ILLUMINATION SUMMARY

SCALE IN FEET 1 : 60



Pole location(s) ⚡ dimensions are relative to 0,0 reference point(s) ⊗



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	UP1, UP2	35'	-	35'	TLC-LED-400	1	1	0
2	TOTALS					2	2	0

Hurd Soccer Field  
Arlington, MA

GRID SUMMARY	
Name:	Parking
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY	
MAINTAINED HORIZONTAL FOOTCANDLES	
Entire Grid	
Scan Average:	2.80
Maximum:	17
Minimum:	0
Avg / Min:	12633.36
Max / Min:	78188.63
UG (adjacent pts):	26.70
CU:	0.73
No. of Points:	222
LUMINAIRE INFORMATION	
Applied Circuits:	B
No. of Luminaires:	2
Total Load:	0.8 kW

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

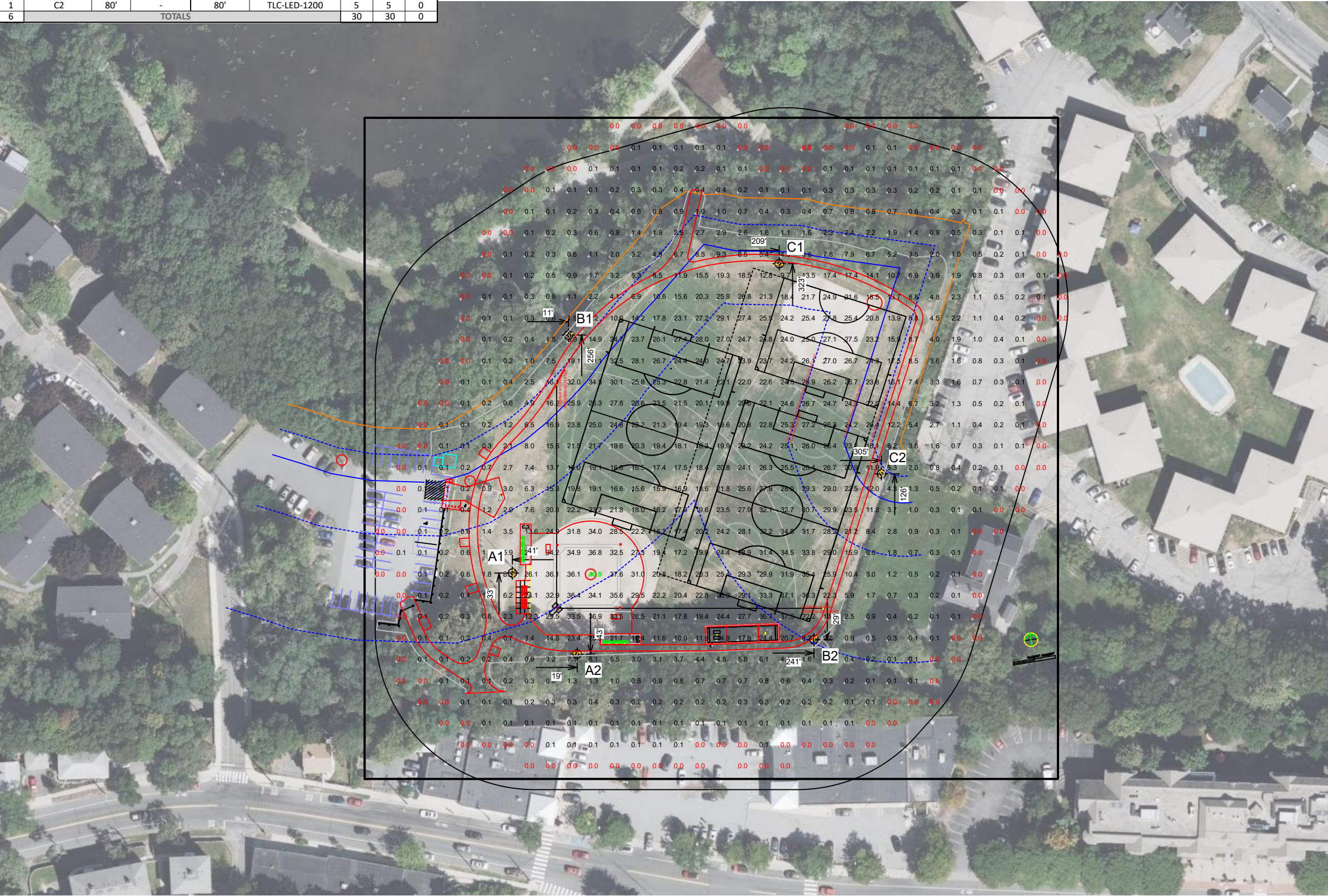
**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



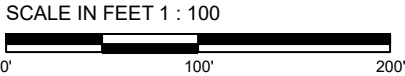


EQUIPMENT LIST FOR AREAS SHOWN									
Pole				Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS	
2	A1-A2	60'	-	60'	TLC-LED-900	1	1	0	
				15.5'	TLC-BT-575	1	1	0	
				60'	TLC-LED-600	2	2	0	
2	B1-B2	60'	-	15.5'	TLC-BT-575	1	1	0	
				60'	TLC-LED-900	5	5	0	
				80'	TLC-LED-1200	5	5	0	
1	C1	80'	-	80'	TLC-LED-1200	5	5	0	
1	C2	80'	-	80'	TLC-LED-1200	5	5	0	
6	TOTALS					30	30	0	





EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	60'	-	60'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				60'	TLC-LED-600	2	2	0
2	B1-B2	60'	-	15.5'	TLC-BT-575	1	1	0
				60'	TLC-LED-900	5	5	0
				80'	TLC-LED-1200	5	5	0
1	C1	80'	-	80'	TLC-LED-1200	5	5	0
1	C2	80'	-	80'	TLC-LED-1200	5	5	0
6	TOTALS					30	30	0



Pole location(s) ⚓ dimensions are relative to 0,0 reference point(s) ⊗

## Hurd Soccer Field

Arlington, MA

GRID SUMMARY	
Name:	150' Spill Line
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY	
HORIZONTAL FOOTCANDLES	
Scan Average:	Entire Grid 0.0176
Maximum:	0.06
Minimum:	0.00
No. of Points:	71
LUMINAIRE INFORMATION	
Applied Circuits:	A
No. of Luminaires:	30
Total Load:	27.0 kW

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



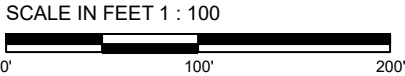
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## ILLUMINATION SUMMARY



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	60'	-	60'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				60'	TLC-LED-600	2	2	0
2	B1-B2	60'	-	15.5'	TLC-BT-575	1	1	0
				60'	TLC-LED-900	5	5	0
				80'	TLC-LED-1200	5	5	0
1	C1	80'	-	80'	TLC-LED-1200	5	5	0
1	C2	80'	-	80'	TLC-LED-1200	5	5	0
6	TOTALS					30	30	0



Pole location(s) ⚓ dimensions are relative to 0,0 reference point(s) ⊗

## Hurd Soccer Field

Arlington, MA

### GRID SUMMARY

Name: 150' Spill Line  
Spacing: 30.0'  
Height: 3.0' above grade

### ILLUMINATION SUMMARY

#### MAX VERTICAL FOOTCANDLES

Entire Grid  
Scan Average: 0.0802  
Maximum: 0.19  
Minimum: 0.00  
No. of Points: 71

#### LUMINAIRE INFORMATION

Applied Circuits: A  
No. of Luminaires: 30  
Total Load: 27.0 kW

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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### ILLUMINATION SUMMARY



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	A1-A2	60'	-	60'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	1	1	0
				60'	TLC-LED-600	2	2	0
				15.5'	TLC-BT-575	1	1	0
2	B1-B2	60'	-	60'	TLC-LED-900	5	5	0
1	C1	80'	-	80'	TLC-LED-1200	5	5	0
1	C2	80'	-	80'	TLC-LED-1200	5	5	0
6	TOTALS					30	30	0



## Hurd Soccer Field

Arlington, MA

### GRID SUMMARY

Name: 150' Spill Line (Cd)  
Spacing: 30.0'  
Height: 5.0' above grade

### ILLUMINATION SUMMARY

#### CANDELA (PER FIXTURE)

Entire Grid  
Scan Average: 4617.7598  
Maximum: 16901.70  
Minimum: 45.21  
No. of Points: 71

#### LUMINAIRE INFORMATION

Applied Circuits: A  
No. of Luminaires: 30  
Total Load: 27.0 kW

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume  $\pm 3\%$  nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

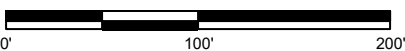


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### ILLUMINATION SUMMARY

SCALE IN FEET 1 : 100



Pole location(s) ⦿ dimensions are relative to 0,0 reference point(s) ⊗





### Hurd Soccer Field

Arlington, MA

#### EQUIPMENT LAYOUT

**INCLUDES:**

- Softball
- Zero Grid

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN							
Pole				Luminaires			
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	
2	A1-A2	60'	-	60'	TLC-LED-900	1	
				15.5'	TLC-BT-575	1	
				60'	TLC-LED-600	2	
2	B1-B2	60'	-	15.5'	TLC-BT-575	1	
				60'	TLC-LED-900	5	
1	C1	80'	-	80'	TLC-LED-1200	5	
1	C2	80'	-	80'	TLC-LED-1200	5	
2	UP1, UP2	35'	-	35'	TLC-LED-400	1	
8	TOTALS						32

SINGLE LUMINAIRE AMPERAGE DRAW CHART							
Ballast Specifications (.90 min power factor)		Line Amperage Per Luminaire (max draw)					
Single Phase Voltage		208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	480 (60)
TLC-LED-600		3.4	3.2	3.0	2.6	2.0	1.9
TLC-LED-400		2.3	2.2	2.0	1.7	1.4	1.3
TLC-LED-1200		7.0	6.6	6.1	5.2	4.2	4.0
TLC-LED-900		5.3	5.0	4.6	4.0	3.2	2.9
TLC-BT-575		3.4	3.2	2.9	2.5	2.0	1.8



## Luminaire Data

Weight (luminaire)	40 lb (18 kg)
UL listing number	E338094
UL listed for USA / Canada	UL1598 CSA-C22.2 No.250.0
CE Declaration	LVD, EMC, RoHS
Ingress protection, luminaire	IP65
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)
UL, IEC ambient temperature rating, luminaire	50°C (122°F)

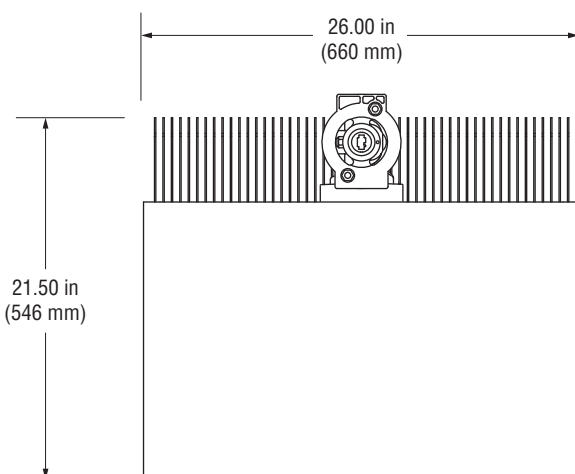
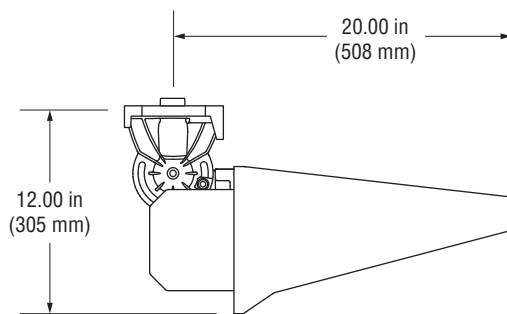
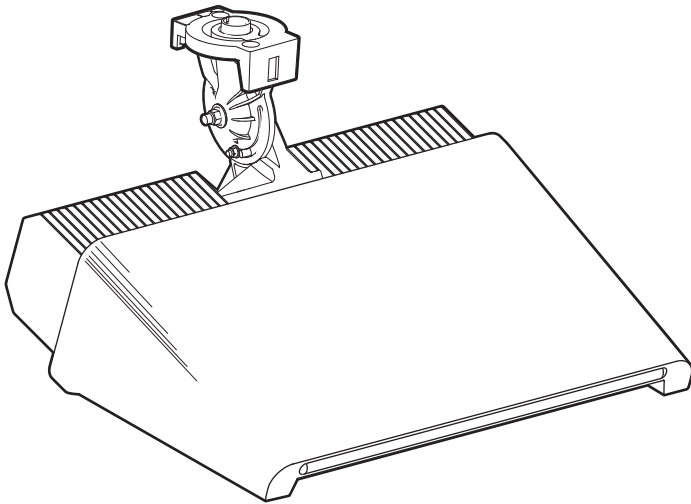
## Photometric Characteristics

Projected lumen maintenance per IES TM-21-11

L90 (13.5k)	>81,000 h
L80 (13.5k)	>81,000 h
L70 (13.5k)	>81,000 h
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
Lumens <sup>1</sup>	89,600

Footnotes:

1) Incorporates appropriate dirt depreciation factor for life of luminaire.



## Driver Data

### Electrical Data

Rated wattage <sup>1</sup>	
Per driver	890 W
Per luminaire	890 W
Number of luminaires per driver	1
Starting (inrush) current	<40 A, 256 $\mu$ s
Fuse rating	15 A
UL, IEC ambient temperature rating, electrical components enclosure	50°C (122°F)
Ingress protection, electrical components enclosure	IP54
Efficiency	95%
Dimming mode	optional
Range, energy consumption	25 – 100%
Range, light output	30 – 100%

	200 Vac 50/60 Hz	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50/60 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
<b>Max operating current per luminaire<sup>2</sup></b>	5.50 A	5.29 A	5.00 A	4.78 A	4.58 A	3.97 A	3.17 A	2.90 A	2.75 A	2.65 A	2.29 A

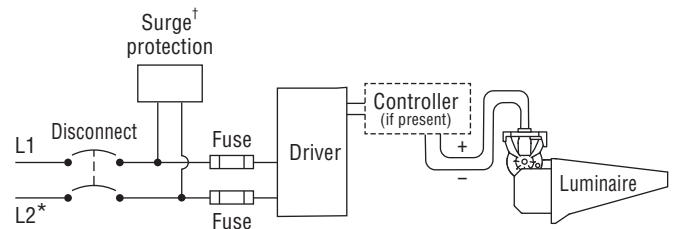
#### Footnotes:

- 1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25°C ambient temperature environment.
- 2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

#### Notes

1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See *Musco Control System Summary* for circuit information.

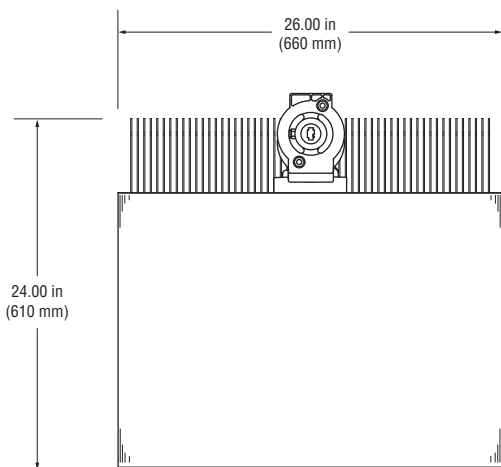
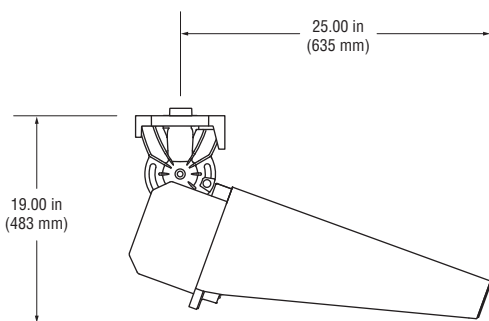
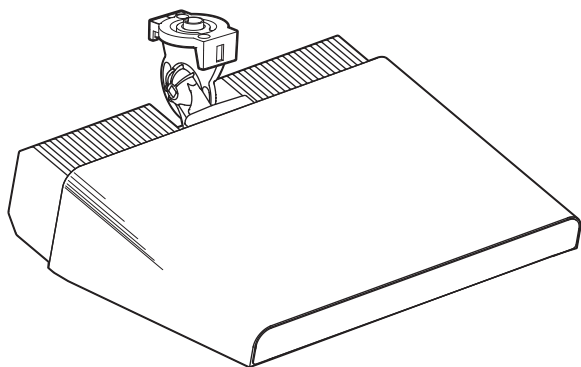
### Typical Wiring



\* If L2 (com) is neutral then not switched or fused.

† Not present if indoor installation.





**Luminaire Data**

Weight (luminaire)	45 lb (20 kg)
UL listing number	E338094
UL listed for USA / Canada	UL1598 CSA-C22.2 No.250.0
CE Declaration	LVD, EMC, RoHS
Ingress protection, luminaire	IP65
Material and finish	Aluminum, powder-coat painted
Wind speed rating (aiming only)	150 mi/h (67 m/s)
UL, IEC ambient temperature rating, luminaire	50°C (122°F)

**Photometric Characteristics**

Projected lumen maintenance per IES TM-21-11

L90 (13.5k)	>81,000 h
L80 (13.5k)	>81,000 h
L70 (13.5k)	>81,000 h
CIE correlated color temperature	5700 K
Color rendering index (CRI)	75 typ, 70 min
Lumens <sup>1</sup>	136,000

Footnotes:

1) Incorporates appropriate dirt depreciation factor for life of luminaire.

## Driver Data

### Electrical Data

Rated wattage <sup>1</sup>	
Per driver	1170 W
Per luminaire	1170 W
Number of luminaires per driver	1
Starting (inrush) current	<40 A, 256 µs
Fuse rating	15 A
UL, IEC ambient temperature rating, electrical components enclosure	50°C (122°F)
Ingress protection, electrical components enclosure	IP54
Efficiency	95%
Dimming mode	optional
Range, energy consumption	14 – 100%
Range, light output	19 – 100%

	200 Vac 50/60 Hz	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50/60 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
<b>Max operating current per luminaire<sup>2</sup></b>	7.26 A	6.98 A	6.60 A	6.31 A	6.05 A	5.24 A	4.18 A	3.82 A	3.63 A	3.50 A	3.03 A

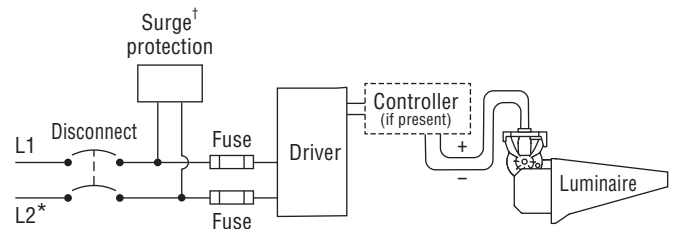
#### Footnotes:

- 1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25°C ambient temperature environment.
- 2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

#### Notes

1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See *Musco Control System Summary* for circuit information.

### Typical Wiring



\* If L2 (com) is neutral then not switched or fused.

† Not present if indoor installation.





## NEW MILFORD HIGH SCHOOL

New Milford, Connecticut, USA

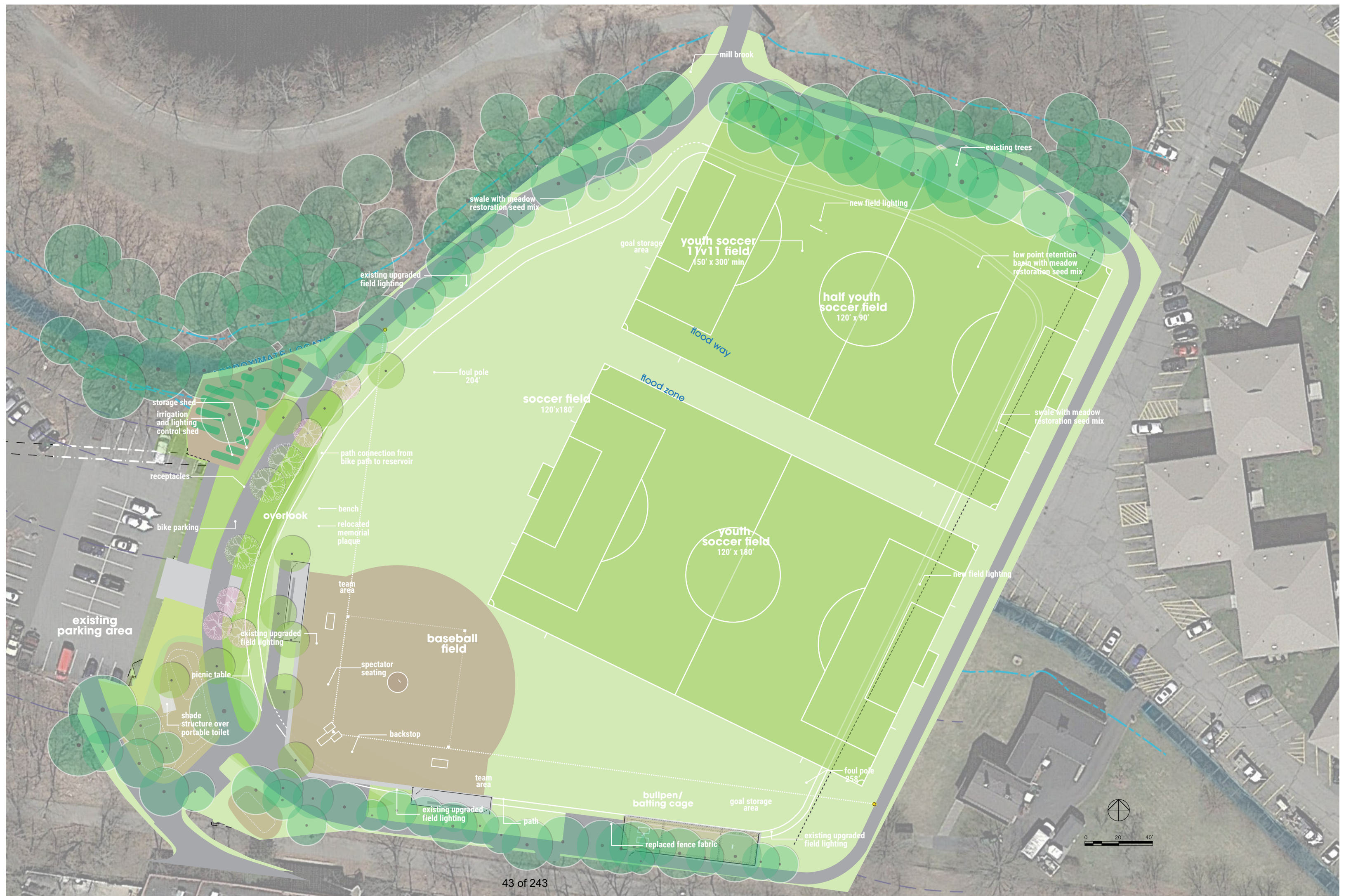
Multipurpose Facility – 50 horizontal footcandles

System Energy Comparison:  
112 kW – 60% reduction from typical HID equipment



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# NOTICE OF INTENT

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*Filed under:*

**MGL. CH. 131 S. 40 AND THE  
TOWN OF ARLINGTON WETLANDS BYLAW**

---

*Located at:*

**COLONIAL VILLAGE DRIVE  
ASSESSORS PARCEL (061.A-1-1 THROUGH 061.A-12-12)  
ARLINGTON, MASSACHUSETTS**

---

*Submitted to:*

**ARLINGTON CONSERVATION COMMISSION  
AND THE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

---

*Applicant:*

**COLONIAL VILLAGE CONDOMINIUM TRUST  
15 TREMONT STREET PH1  
BOSTON, MASSACHUSETTS 02111**

---



Professional Civil Engineering • Project Management • Land Planning  
150 Longwater Drive, Suite 101, Norwell, Massachusetts 02061  
Tel.: (781) 792-3900 Facsimile: (781) 792-0333  
[www.mckeng.com](http://www.mckeng.com)

December 13, 2021  
Revised January 24, 2022

## **TABLE OF CONTENTS**

### **SECTION I**

- WPA Form 3 – Notice of Intent
- Figure 1 – USGS Locus Map
- Figure 2 – FEMA Flood Map
- Figure 3 – Natural Heritage & Endangered Species Map
- Figure 4 – NRCS Soils Survey

### **SECTION II**

- Project Narrative
- Wetland Delineation Report

### **SECTION III**

- WPA Wetland Fee Transmittal Form
- Copy of Checks

### **SECTION IV**

- Certified List of Abutters
- Assessors Map

## **S E C T I O N I**

**WPA Form 3 – Notice of Intent**

**Figure 1 – USGS Locus Map**

**Figure 2 – FEMA Flood Map**

**Figure 3 – Natural Heritage & Endangered  
Species**

**Figure 4 – NRCS Soils Survey**



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

# WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

**Important:**

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:  
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

## A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Colonial Village Drive

a. Street Address

Arlington

b. City/Town

02474

c. Zip Code

Latitude and Longitude:

42d 25'34" N

d. Latitude

71d 11'10" W

e. Longitude

Map 61

f. Assessors Map/Plat Number

Lot A-1-1 through A-12-12

g. Parcel /Lot Number

2. Applicant:

a. First Name

Colonial Village Condominium Trust

b. Last Name

c. Organization

15 Tremont Street PH1

d. Street Address

Boston

e. City/Town

MA

f. State

02111

g. Zip Code

617-423-7000

h. Phone Number

i. Fax Number

afoley@firstrealtymgt.com

j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Austin

a. First Name

Chartier, PE

b. Last Name

McKenzie Engineering Group, Inc.

c. Company

150 Longwater Drive, Suite 101

d. Street Address

Norwell

e. City/Town

MA

f. State

02061

g. Zip Code

781-792-3900

h. Phone Number

781-792-0333

i. Fax Number

achartier@mckeng.com

j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

\$4,500.00

a. Total Fee Paid

\$2,237.50

b. State Fee Paid

\$2,262.50

c. City/Town Fee Paid



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

**A. General Information (continued)**

6. General Project Description:

The project will include complete parking lot reconstruction, drainage improvements and grading in FEMA Zone AE.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Single Family Home                        | 2. <input type="checkbox"/> Residential Subdivision       |
| 3. <input type="checkbox"/> Commercial/Industrial                     | 4. <input type="checkbox"/> Dock/Pier                     |
| 5. <input type="checkbox"/> Utilities                                 | 6. <input type="checkbox"/> Coastal engineering Structure |
| 7. <input type="checkbox"/> Agriculture (e.g., cranberries, forestry) | 8. <input type="checkbox"/> Transportation                |
| 9. <input checked="" type="checkbox"/> Other                          |   |

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR 10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Middlesex

a. County

21896

c. Book

b. Certificate # (if registered land)

562

d. Page Number

**B. Buffer Zone & Resource Area Impacts (temporary & permanent)**

- ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

**B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)**

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input checked="" type="checkbox"/> Bank	25 1. linear feet	25 2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input checked="" type="checkbox"/> Bordering Land Subject to Flooding	75,450 1. square feet 0 3. cubic feet of flood storage lost	75,450 2. square feet 1,500 +/- 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	Mill Brook (Inland) 1. Name of Waterway (if available) - <b>specify coastal or inland</b>	

2. Width of Riverfront Area (check one):

- ☐ 25 ft. - Designated Densely Developed Areas only
- ☐ 100 ft. - New agricultural projects only
- ☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 137,724  
square feet

4. Proposed alteration of the Riverfront Area:

<u>60,890</u>	<u>45,586</u>	<u>15,304</u>
a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☒ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

**Note:** for coastal riverfront areas, please complete **Section B.2.f.** above.





**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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Arlington

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**B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)**

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:  
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet _____ 2. cubic yards dredged _____	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet _____	2. cubic yards beach nourishment _____
e. <input type="checkbox"/> Coastal Dunes	1. square feet _____	2. cubic yards dune nourishment _____
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	1. linear feet _____	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet _____	
h. <input type="checkbox"/> Salt Marshes	1. square feet _____	2. sq ft restoration, rehab., creation _____
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet _____	
	2. cubic yards dredged _____	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet _____	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged _____	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	1. square feet _____	
4. <input type="checkbox"/> Restoration/Enhancement		
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.		
a. square feet of BVW _____	b. square feet of Salt Marsh _____	

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings \_\_\_\_\_

b. number of replacement stream crossings \_\_\_\_\_



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**C. Other Applicable Standards and Requirements**

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

**Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review**

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to [http://maps.massgis.state.ma.us/PRI\\_EST\\_HAB/viewer.htm](http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm).

a. ☐ Yes ☒ No

**If yes, include proof of mailing or hand delivery of NOI to:**

**Natural Heritage and Endangered Species Program  
Division of Fisheries and Wildlife  
1 Rabbit Hill Road  
Westborough, MA 01581**

August 2017

b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review\*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area

percentage/acreage

(b) outside Resource Area

percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work \*\*

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

\* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <https://www.mass.gov/endangered-species-act-mesa-regulatory-review>).

Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

\*\* MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



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**C. Other Applicable Standards and Requirements (cont'd)**

- (c) ☐ MESA filing fee (fee information available at <https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review>).

Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

*Projects altering 10 or more acres of land, also submit:*

- (d) ☐ Vegetation cover type map of site
- (e) ☐ Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.  
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, <https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat>; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # \_\_\_\_\_ b. Date submitted to NHESP \_\_\_\_\_

3. ☐ Separate MESA review completed.  
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

- a. ☒ Not applicable – project is in inland resource area only      b. ☐ Yes    ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -  
Southeast Marine Fisheries Station  
Attn: Environmental Reviewer  
836 South Rodney French Blvd.  
New Bedford, MA 02744  
Email: [dmf.envreview-south@mass.gov](mailto:dmf.envreview-south@mass.gov)

Division of Marine Fisheries -  
North Shore Office  
Attn: Environmental Reviewer  
30 Emerson Avenue  
Gloucester, MA 01930  
Email: [dmf.envreview-north@mass.gov](mailto:dmf.envreview-north@mass.gov)

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

- c. ☐ Is this an aquaculture project?      d. ☐ Yes    ☐ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).





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## **C. Other Applicable Standards and Requirements (cont'd)**

**Online Users:**

Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?  
 a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.  
 b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?  
 a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?  
 a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?  
 a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
  1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
  2. ☐ A portion of the site constitutes redevelopment
  3. ☒ Proprietary BMPs are included in the Stormwater Management System.
- b. ☐ No. Check why the project is exempt:
  1. ☐ Single-family house
  2. ☐ Emergency road repair
  3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

## **D. Additional Information**

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

**Online Users:** Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



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**D. Additional Information (cont'd)**

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.
- Parking Lot Reconstruction, Colonial Village Drive, APN:61.A-1-1 through 61.A-12-12, Arlington, MA
- |   |                            |
|---|----------------------------|
| <u>McKenzie Engineering Group, Inc.</u>                     | <u>Bradley C. McKenzie</u> |
| b. Prepared By  | c. Signed and Stamped by   |
| <u>December 13, 2021</u>                                    | <u>As Noted</u>            |
| d. Final Revision Date                                      | e. Scale                   |
| <u>Drainage Calculations and Stormwater Management Plan</u> | <u>December 13, 2021</u>   |
| f. Additional Plan or Document Title                        | g. Date                    |
5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☒ Attach NOI Wetland Fee Transmittal Form
9. ☒ Attach Stormwater Report, if needed.

**E. Fees**

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

<u>000089</u>	<u>11/16/2021</u>
2. Municipal Check Number	3. Check date
<u>000088</u>	<u>11/16/2021</u>
4. State Check Number	5. Check date
<u>Colonial Village Condominium</u>	
6. Payor name on check: First Name	7. Payor name on check: Last Name



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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**F. Signatures and Submittal Requirements**

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

11/3/2021 | 4:45 PM EDT

DocuSigned by:  
  
3B9E657FCF464BC...

1. Signature of Applicant

2. Date

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date

12-13-2001

**For Conservation Commission:**

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

**For MassDEP:**

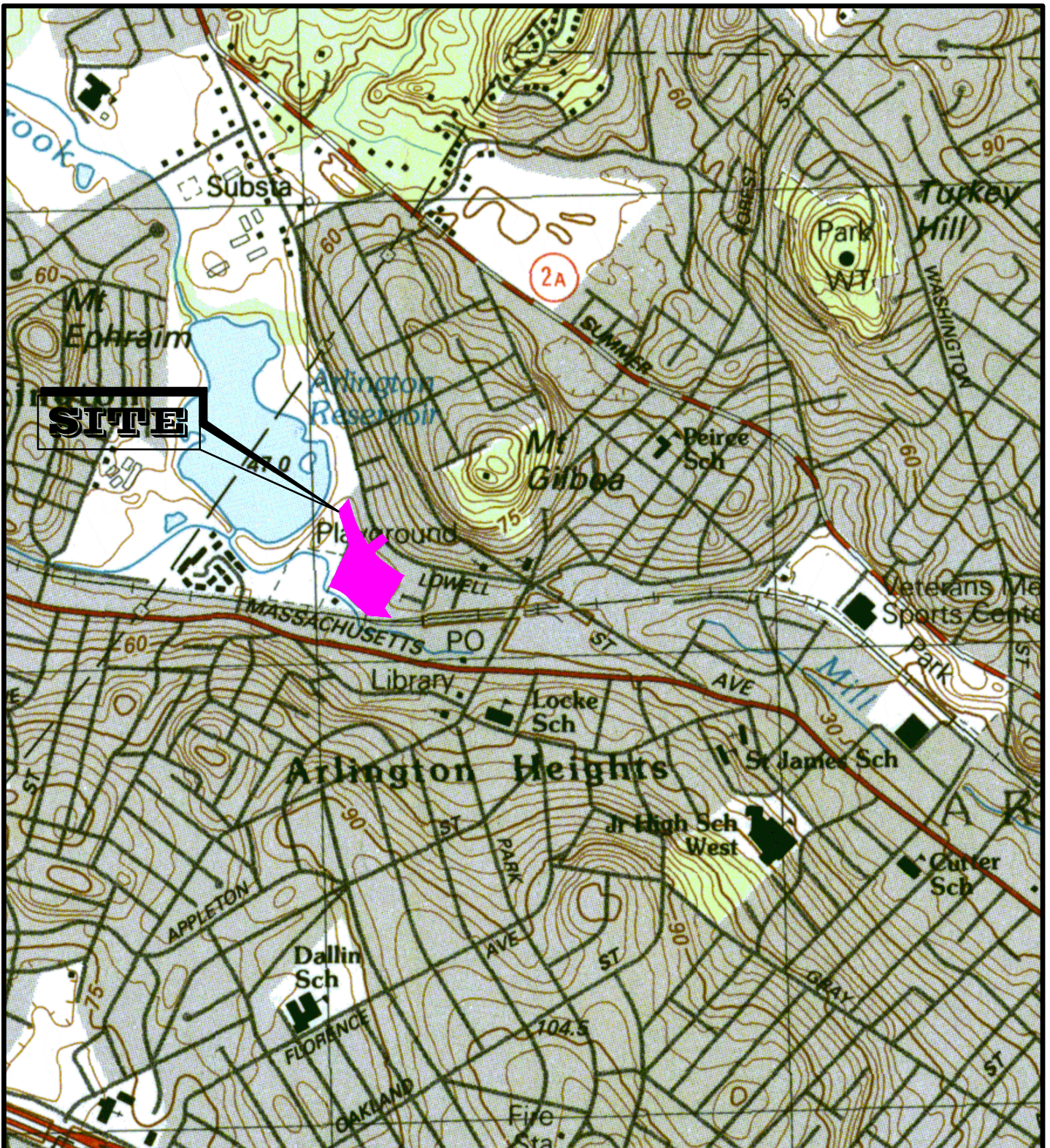
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

**Other:**

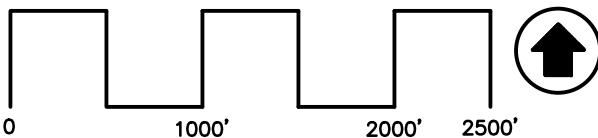
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.





**FIGURE - 1**



U.S. GEOLOGICAL SURVEY  
7.5 X 15 MINUTE SERIES

© MCKENZIE ENGINEERING GROUP, INC.



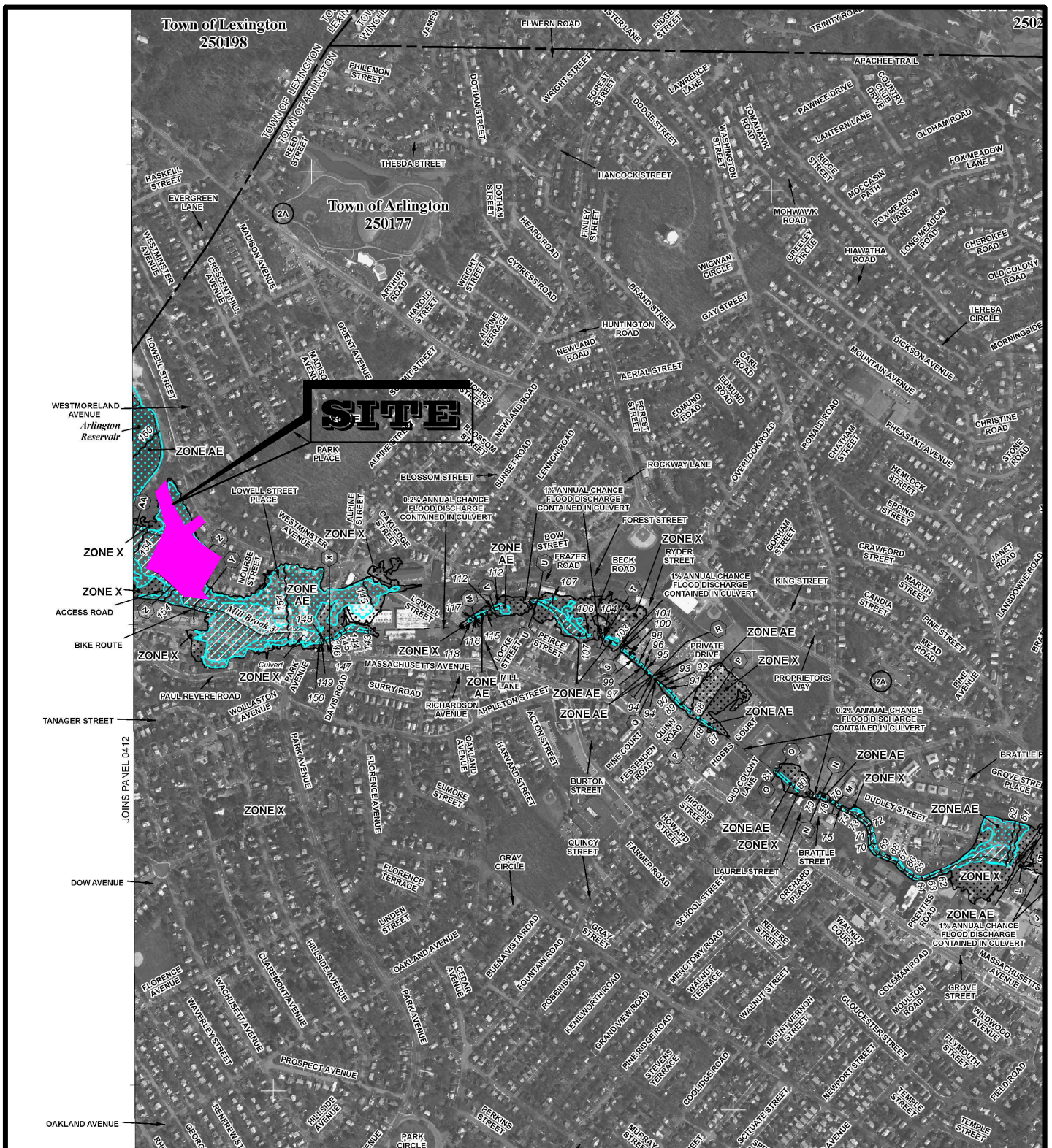
Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
[www.mckeng.com](http://www.mckeng.com)

## USGS LOCUS MAP

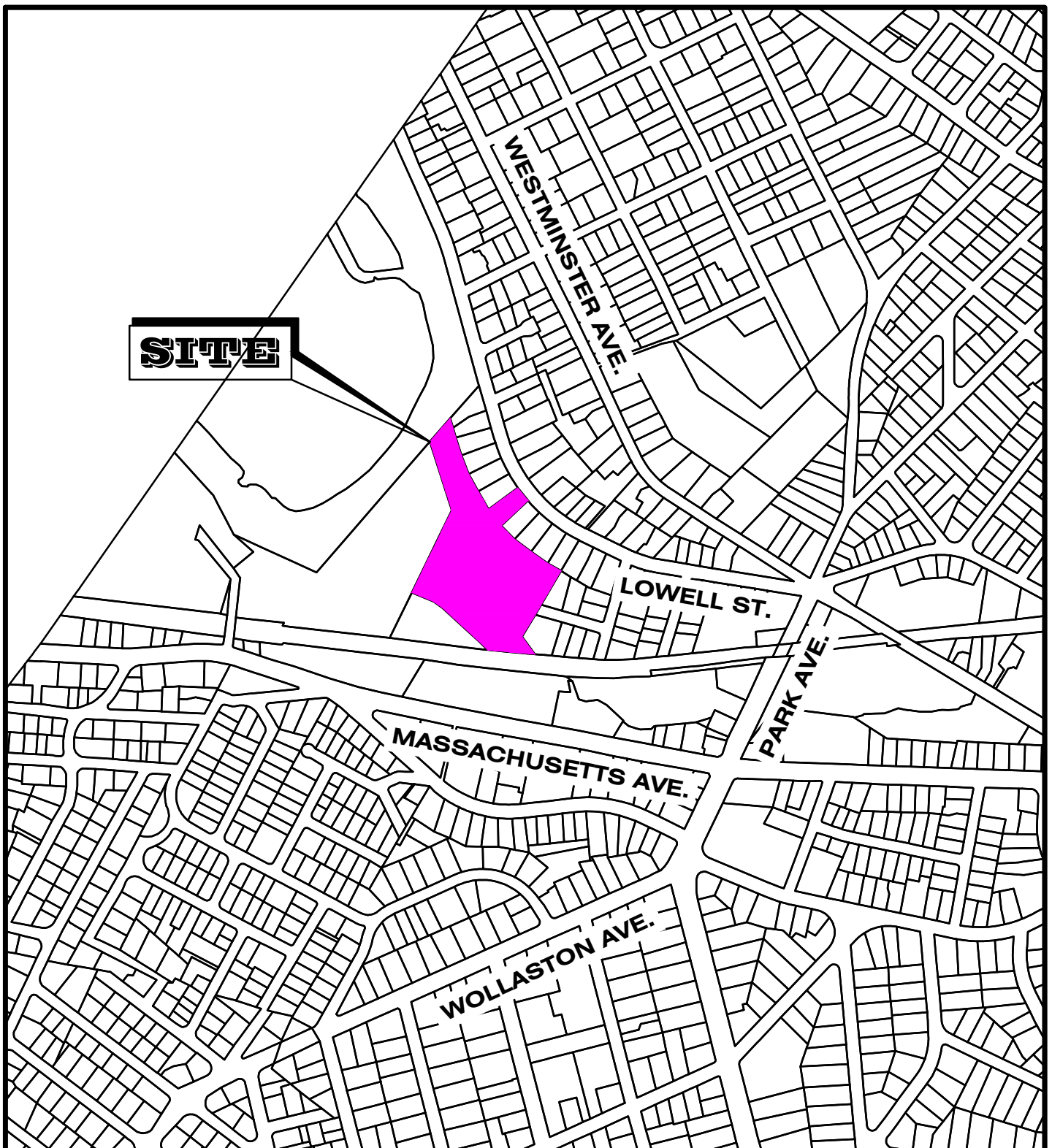
COLONIAL VILLAGE DRIVE  
(APN: 061.A-1-1 THROUGH 061.A12-12)  
ARLINGTON, MASSACHUSETTS

56 of 243

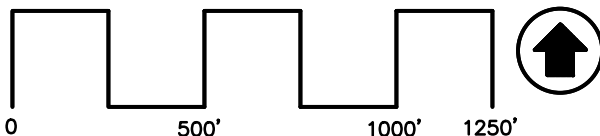








**FIGURE - 3**



NATURAL HERITAGE AND  
ENDANGERED SPECIES PROGRAM  
2017 EDITION

© MCKENZIE ENGINEERING GROUP, INC.



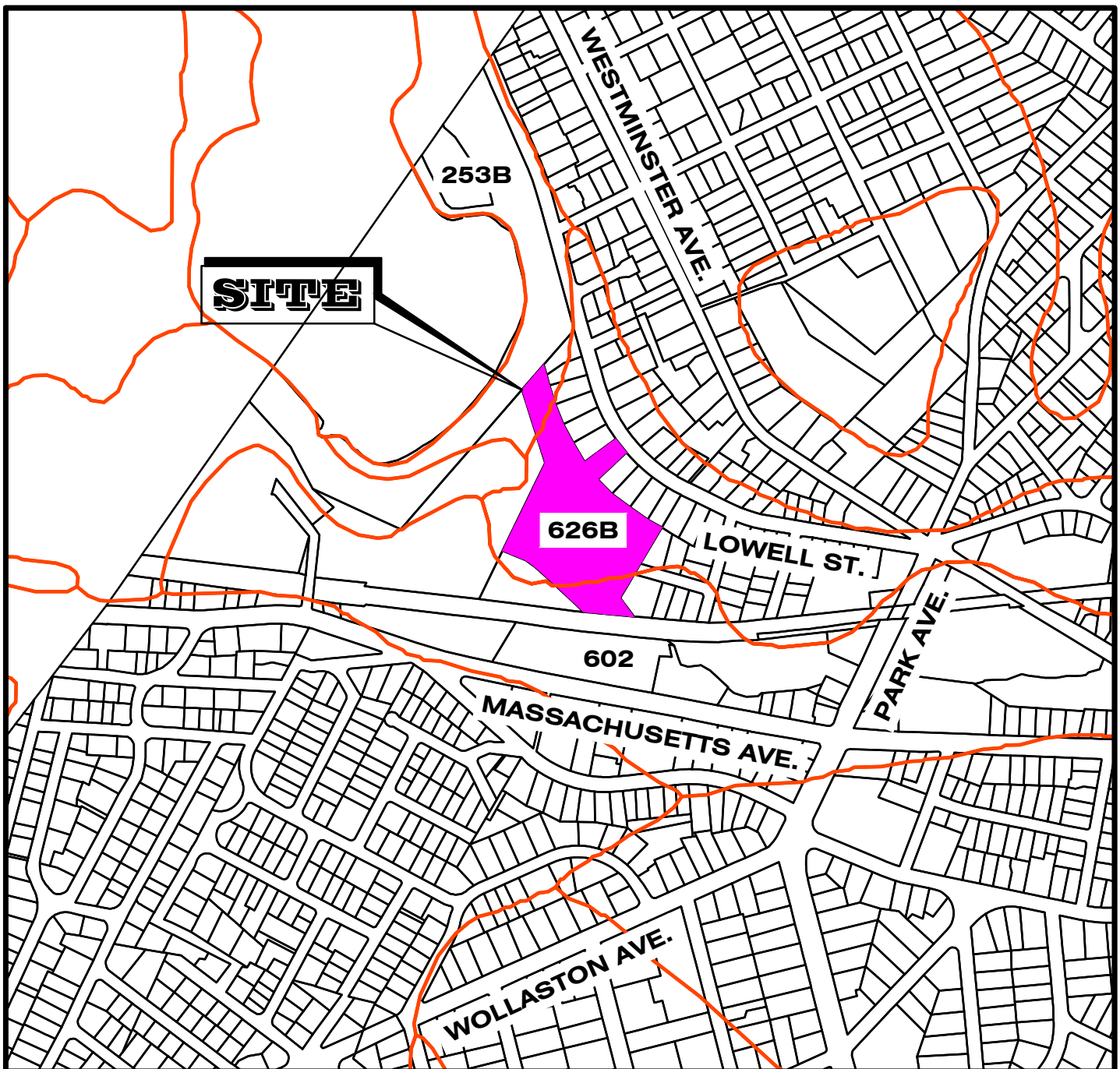
Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
[www.mckeng.com](http://www.mckeng.com)

**NATIONAL HERITAGE AND  
ENDANGERED SPECIES MAP**

COLONIAL VILLAGE DRIVE  
(APN: 061.A-1-1 THROUGH 061.A12-12)  
ARLINGTON, MASSACHUSETTS

58 of 243

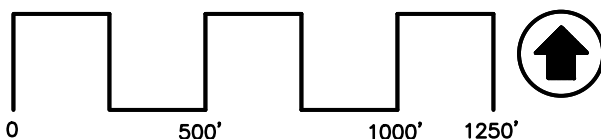




### SOIL KEY

SOIL CLASSIFICATION	DESCRIPTION	HYDROLOGIC SOIL GROUP
253B	HINCKLEY LOAMY SAND, 3-8% SLOPES	A
602	URBAN LAND	UNCLASSIFIED
626B	MERRIMAC-URBAN LAND COMPLEX, 0-8% SLOPES	A

## FIGURE - 4



NRCS SOIL SURVEY  
MIDDLESEX COUNTY



Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
[www.mckeng.com](http://www.mckeng.com)

## NRCS SOILS MAP

COLONIAL VILLAGE DRIVE  
(APN: 061.A-1-1 THROUGH 061.A12-12)  
ARLINGTON, MASSACHUSETTS

## **SECTION II**

### **Project Narrative Wetland Delineation Report**

**PROJECT NARRATIVE**  
**Parking Lot Reconstruction**  
**Colonial Village Drive, Arlington, MA**

**1.0 Project Description**

The project proponent, Colonial Village Condominium Trust, proposes full depth pavement reconstruction at Colonial Village Drive in Arlington, Massachusetts. The proposed project will consist of the reconstruction of all on-site bituminous concrete parking and access driveways, curbing, installation of stormwater management systems and site grading.

The parcel is shown on the Town of Arlington Assessors Maps as Parcel ID 061.A-1-1 through 061.A-12-12 and is comprised of 4.53 acres. The parcel's frontage is on Lowell Street at the northeast property line. The site is located entirely within the Residence 5 (R5) Zoning District, and abuts residential development to the north, east, and south, and Town-owned property to the west. The parcel is currently developed consisting of twelve 12-unit condominium buildings, bituminous concrete parking and access driveways, and landscaped areas. Refer to Figure 1- USGS Locus Map for the location of the parcel.

This Notice of Intent filing includes under separate cover a report entitled "Drainage Calculations and Stormwater Management Plan – Colonial Village Drive, Arlington, MA", dated December 13, 2021, prepared by McKenzie Engineering Group, Inc. (MEG) which includes the sizing of the proposed drainage system and stormwater best management practices (BMPs). The project is a redevelopment project under the Department of Environment Protection's Stormwater Management Regulations and as such the stormwater management system has been designed to comply to the maximum extent practicable with all standards.

The work proposed under this Notice of Intent includes the reconstruction of all on-site bituminous concrete parking and access driveways, curbing, installation of stormwater management systems and site grading within a 100-foot Buffer Zone to Inland Bank, within the 200-foot Riverfront Area and Bordering Land Subject to Flooding (FEMA AE Zone with BFE 154' NAVD88).

**2.0 Wetland Resource Description**

*Inland Bank*

Wetland resource areas are located on the near western and southern portion of the site associated with a U.S.G.S. mapped perennial stream that flows within a concrete walled stream system. The perennial stream flows from the Arlington Reservoir and is channelized by concrete walls on either side. The concrete walls function as Inland Banks to the stream. The landward limits of the Inland Bank on site were delineated by Environmental Consulting & Restoration, LLC (ECR) on July 12, 2021. Refer to the



Wetland Delineation Memo prepared by ECR dated July 30, 2021 in Section II for more information.

Approximately 25 linear feet of the existing concrete walls which channelize Mill Brook and act as Inland Banks to the stream will be altered and replaced. Alteration is caused by coring of the wall for installation of First Defense Unit outfalls.

#### *Riverfront Area*

The site falls within the 200-foot Riverfront Area associated with Mill Brook. Proposed work within the riverfront area complies with the performance standards for riverfront areas under 310 CMR 10.58(5) Redevelopment Within Previously Developed Riverfront Areas; Restoration and Mitigation. The project complies with 10.85(5) as outlined below:

- (a) The proposed project results in an improvement over existing conditions due to the following:
  - 1. The existing site has no stormwater management facilities and does not comply with the DEP Stormwater Management Regulations. The proposed project utilizes proprietary First Defense Units to treat surface runoff before discharging to Mill Brook.
  - 2. A construction phase and post-development operation and maintenance plan will be implemented to maintain the integrity of the site and minimize the potential for erosion.
- (b) Although the site is a redevelopment project, the proposed site development includes a stormwater management system designed to comply with the Stormwater Management Regulations to the maximum extent practicable.
- (c) No degraded areas are proposed to be closer to Mill Brook than in the existing condition.
- (d) Due to the existing parking lot's location being partially within the riverfront area, it is not possible to situate work outside the riverfront area.
- (e) The project includes reconstruction of approximately 60,890 s.f. of parking lot area within the Riverfront Area. No new degraded areas are proposed within the Riverfront Area.
- (f) No restoration of Riverfront Area is proposed for this project. Proposed work includes reconstruction of previously degraded areas in place.
- (g) Off-site mitigation is not proposed for this project.
- (h) Not Applicable, no restoration areas proposed for this project.

### *Bordering Land Subject to Flooding*

The site is located within Bordering Land Subject to Flooding (FEMA Zone AE with BFE 154' NAVD88) according to Federal Emergency Management Agency (FEMA) flood maps as shown on the current FEMA Flood Insurance Rate Map Panel No. 25017C0416E with an effective date of June 4, 2010. Refer to Figure 2 – FEMA Flood Map. Proposed work within Bordering Land Subject to Flooding complies with the performance standards for Bordering Land Subject to Flooding under 310 CMR 10.57(4)(a). The project complies with 10.57(4)(a) as outlined below:

1. The proposed project will result in approximately 1,600 c.f. of additional flood storage. (See storage table below)
2. Proposed work will not restrict flows or cause an increase in flood stage or velocity.
3. No portion of bordering land subject to flooding within the limit of work is significant to the protection of wildlife habitat.

COMPENSATORY STORAGE VOLUME (UNDER ELEVATION 154.00)						
	EXISTING			PROPOSED		
ELEVATION	SURFACE AREA WITHIN PROPERTY LINE (S.F.)	AVERAGE SURFACE AREA (S.F.)	VOLUME (C.F.)	SURFACE AREA WITHIN PROPERTY LINE (S.F.)	AVERAGE SURFACE AREA (S.F.)	VOLUME (C.F.)
151.00	0.00			120.00		
		14,027.31	3,506.83		17,271.56	4,317.89
152.00	28,054.61			34,423.12		
		65,547.50	16,386.88		68,744.19	17,186.05
153.00	103,040.39			103,065.25		
		120,500.13	30,125.03		120,512.56	30,128.14
154.00	137,959.86			137,959.86		
TOTAL VOL. (C.F.)	50,018.73			51,632.08		
Δ (C.F.)	1,613.34					

Proposed work within Bordering Land Subject to Flooding also complies with the Town of Arlington's Regulations for Wetlands Protection Section 23D as outlined below:

1. The proposed project will result in approximately 1,600 c.f. of additional flood storage. (See storage table above)
2. The project site does not fall within a public or private water supply or groundwater supply area.
3. Proposed work will not result in an adverse effect on the capacity of lands subject to flooding to prevent pollution of the groundwater. Existing surface types shall be retained.

### *Adjacent Upland Resource Area*

The site falls within the Adjacent Upland Resource Area per Section 25 of the Town of Arlington's Regulations for Wetlands Protection and is depicted by the 'Limit of 100' Buffer Zone to Inland Bank' shown on site plans. The project complies with Section 25C through 25H as outlined below:

- C. Since the existing site falls within the Adjacent Upland Resource Area, there is no alternative to complete the proposed work without temporarily disturbing the resource area. The area of the site within the first 25' of the Adjacent Upland Resource Area contains parking areas required for the existing residential development.
- D. The portion of the site which falls within the first 25' of the Adjacent Upland Resource Area currently consists entirely of parking areas. These areas will continue to serve as parking areas and no newly disturbed areas are proposed within the 25' buffer.
- E. No new impervious surfaces are proposed within the first 50 feet of the Adjacent Upland Resource Area.
- F.
  - 1. The proposed total impervious surface within the Adjacent Upland Resource Area will match that of existing conditions.
  - 2. No new impervious surfaces are proposed farther into the Adjacent Upland Resource Area than pre-project conditions.
- G. The proposed project will not require changing of oil, refueling, or damage to any vegetation. The site will continue to be used as a residential development only. For more information on proposed measures to protect the Adjacent Upland Resource Area, refer to the project Operation and Maintenance plans in Appendix E of report entitled "Drainage Calculations and Stormwater Management Plan", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG.
- H. The activities listed in this section do not apply to the proposed project.

### *Other Resources*

The site does not contain any certified vernal pools and is not located within Estimated Habitat of Rare Wetlands Wildlife, as determined by reference to the Massachusetts Division of Fisheries and Wildlife Natural Heritage Atlas 2017 edition and data provided by Mass GIS. Refer to Figure 3 – Natural Heritage and Endangered Species Map. The site is not located within an Area of Critical Environmental Concern (ACEC).



### 3.0 Mitigation Measures

The following are mitigation measures that will be employed to ensure that impacts to wetland values protected under the Town of Arlington Wetlands Protection Regulations (WPR) and the Wetlands Protection Act are minimized to the extent possible.

Construction of the site infrastructure will require work within a 100-foot Buffer Zone to Inland Bank, 200-foot Riverfront Area, and Bordering Land Subject to Flooding (FEMA AE Zone). Alteration of resource areas will be limited to that required to properly reconstruct the bituminous concrete parking and access driveways.

#### *Climate Change Resilience*

Pursuant to Section 31B of the Town of Arlington Wetlands Protection Regulations, the following climate resilience strategies have been taken into consideration:

1. The proposed project will increase the flood storage capacity of the site and will limit storm and flood damage during extended periods of disruption and flooding as might be expected in extreme weather events.
2. Stormwater surface runoff rates and the total amount of impervious surfaces on site will remain the same as existing conditions. The project proposes the installation of Proprietary First Defense Pretreatment Units to enhance the water quality of stormwater runoff before being discharged into Mill Brook.
3. No vegetated areas will be permanently impacted as a result of the proposed work.
4. The proposed project does not include any new structures. Existing structures on site will benefit from increased flood storage capacity along Mill Brook which will limit the chance of damage to the structures during a storm event.

#### *Public or Private Water Supply/Groundwater Quality*

The project's development will not adversely affect the quality or quantity of any public or private water supply. Pesticides and herbicides shall not be used within the limits of the 100' buffer zone to the wetland resource areas. Fertilizers that are used within this zone should be restricted to the use of organic fertilizers only. The proposed compost filter tube erosion control barrier will serve to prevent the migration of sediments towards wetland resource areas.

#### *Water Pollution Control*

In addition to the above measures that will also serve to maintain the pollution prevention functions of the resource area, the cutting of vegetation within the buffer zone will be restricted to only the limit of work shown on the plan. In addition, the proposed compost filter tube will serve to prevent the migration of sediments towards the wetland resource areas. The

design of the site development incorporates First Defense Units intended to improve water quality from the site's stormwater runoff.

#### *Flood Control/Storm Damage Prevention*

The proposed redevelopment project has been designed to comply to the maximum extent practicable with the DEP Stormwater Management Regulations. The flooding impacts have been analyzed and the pre development peak discharge rate of runoff has been maintained. The proposed project will not obstruct the flow of water or increase flood heights within the flood plain.

#### *Sedimentation and Erosion Control*

Compost filter tube (Silt sock) erosion control barriers will be placed at the limit of work prior to the commencement of any construction activity. The integrity of the silt sock will be maintained by periodic inspection and replacement as necessary. The silt sock will remain in place until the first course of pavement has been placed and all side slopes have been loamed and seeded and vegetation has been established. Refer to the Erosion Control details on the Site Development Plans.

The potential for temporary impacts to wetlands due to erosion and migration of sediments into adjacent wetlands will be mitigated by adherence to basic erosion control practices.

These include but not limited to the following:

1. Install compost filter tube erosion control barriers (see plan detail) according to the approved plan. This erosion control barrier shall be installed prior to any work at the site. An additional stockpile of compost filter tube and siltation fence will be stored on site for use in repairing the erosion control barrier as needed. Inspections of the erosion control barrier shall be made weekly and after all significant rainfall events.
2. Clearly define the limits of work in the field in order to minimize the extent of site disturbance.
3. Regularly inspect and maintain erosion controls and sedimentation traps during construction.



Environmental Consulting & Restoration, LLC



## WETLAND DELINEATION MEMO

**TO:** McKenzie Engineering Group

**FROM:** Brad Holmes

**DATE:** July 30, 2021

**RE:** Colonial Village, Arlington

Per your request, Environmental Consulting & Restoration, LLC (ECR) performed a review of the existing conditions at the Colonial Village condominium complex located at Colonial Village Drive in Arlington (the Site) on July 12, 2021. The purpose of the review was to identify wetland resource areas on and near the site. The site consists of multiple condominium/apartment buildings with associated paved driveways, parking areas, landscaped areas, etc. The weather on July 12<sup>th</sup> was overcast, warm (approximately 65 degrees), and damp from occasional showers. Wetland resource areas are located on the near western and southern portion of the site associated with a U.S.G.S. mapped perennial stream that flows within a concrete walled stream system. The perennial stream flows from the Arlington Reservoir and is channelized by concrete walls on either side. The concrete walls function as Inland Banks to the stream. There are no vegetated wetlands associated with this stream. For reference, ECR hung Inland Bank flags #IB1 to #IB17 at the top of the Inland Bank/concrete wall of this stream facing the site. As a result of ECR's site, ECR is able to confirm that the site contains the following wetland resource areas and areas of Conservation Commission jurisdiction:

- Inland Bank of a perennial stream
- 100-foot Buffer Zone to Inland Bank
- 200-foot Riverfront Area
- Bordering Land Subject to Flooding (FEMA AE Zone)

Also review of the MassGIS wetlands database reveals the following:

1. The site is not located within Estimated/Priority Habitat for Rare Species according to the Massachusetts Natural Heritage & Endangered Species Program (MaNHESP).
2. The site does not contain Certified Vernal Pools according to the MaNHESP.
3. The site is not located within an Area of Critical Environmental Concern.

Upon review of this wetland delineation memo, please contact me at (617) 529 – 3792 or [brad@ecrwetlands.com](mailto:brad@ecrwetlands.com) with any questions or requests for additional information.

Thank you,  
Brad Holmes, Professional Wetland Scientist #1464  
Manager



### **SECTION III**

**WPA Wetland Fee Transmittal Form  
Copy of Checks**



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**NOI Wetland Fee Transmittal Form**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



## A. Applicant Information

### 1. Location of Project:

Colonial Village Drive

a. Street Address

000088

c. Check number

Arlington

b. City/Town

\$2,237.50

d. Fee amount

### 2. Applicant Mailing Address:

a. First Name

Colonial Village Condominium Trust

c. Organization

15 Tremont Street PH1

d. Mailing Address

Boston

e. City/Town

617-423-7000

h. Phone Number

i. Fax Number

MA

f. State

02111

g. Zip Code

afoley@firstrealtymgt.com

j. Email Address

### 3. Property Owner (if different):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

## B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

**Step 1/Type of Activity:** Describe each type of activity that will occur in wetland resource area and buffer zone.

**Step 2/Number of Activities:** Identify the number of each type of activity.

**Step 3/Individual Activity Fee:** Identify each activity fee from the six project categories listed in the instructions.

**Step 4/Subtotal Activity Fee:** Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

**Step 5/Total Project Fee:** Determine the total project fee by adding the subtotal amounts from Step 4.

**Step 6/Fee Payments:** To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**NOI Wetland Fee Transmittal Form**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**B. Fees** (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
2b - Parking Lot	1	\$500.00	\$500.00
2g - Each project source discharge	5	\$500.00	\$2,500.00
Step 5/Total Project Fee:			\$3,000 x 1.5 = \$4,500

**Step 6/Fee Payments:**

Total Project Fee:	\$4,500.00
	a. Total Fee from Step 5
State share of filing Fee:	\$2,237.50
	b. 1/2 Total Fee <b>less</b> \$12.50
City/Town share of filing Fee:	\$2,262.50
	c. 1/2 Total Fee <b>plus</b> \$12.50

**C. Submittal Requirements**

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection  
Box 4062  
Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

**To MassDEP Regional Office** (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)





Massachusetts Department of Environmental Protection  
Bureau of Resource Protection – Wetlands & Waterways

## BRP WPA Form 3 - Notice of Intent Instructions and Supporting Materials

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### Category Activities and Fees

**Category 1** (Fee for each activity is **\$110**):

- a.) work on single family lot; addition, pool, etc.;
- b.) site work without a house;
- c.) control vegetation;
- d.) resource improvement;
- e.) work on septic system separate from house;
- f.) monitoring well activities minus roadway;
- g.) new agricultural or aquaculture projects.

**Category 2** (Fee for each activity is **\$500**):

- a.) construction of single family house;
- b.) parking lot;
- c.) beach nourishment;
- d.) coastal limited projects;
- e.) inland limited projects minus road crossings and agriculture;
- f.) each crossing for driveway to single family house;
- g.) each project source (storm drain) discharge;
- h.) control vegetation in development;
- i.) water level variations;
- j.) any other activity not in Category 1, 3, 4, 5 or 6;
- k.) water supply exploration.

**Category 3** (Fee for each activity is **\$1,050**):

- a.) site preparation (for development) beyond Notice of Intent scope;
- b.) each building (for development) including site;
- c.) road construction not crossing or driveway;
- d.) hazardous cleanup;
- e.) water supply development.

**Category 4** (Fee for each activity is **\$1,450**):

- a.) each crossing for development or commercial road;
- b.) dam, sluiceway, tidegate (safety) work;
- c.) landfills operation/closures;
- d.) sand and gravel operations;
- e.) railroad line construction;
- f.) bridge;
- g.) hazardous waste alterations to resource areas;
- h.) dredging;
- i.) package treatment plant and discharge;
- j.) airport tree clearing;
- k.) oil and/or hazardous material release response actions.

**Category 5** (Fee is **\$4 per linear foot**; total fee not less than \$100 or more than \$2,000):

- a.) work on docks, piers, revetments, dikes, etc. (coastal or inland).

**Category 6** (Fee is **\$2 per linear foot for each resource area**): **For each resource area delineation, the fee shall not exceed \$200 for activities associated with a single family house or \$2,000 for all other activities).**



**Colonial Village Condominium**151 Tremont Street  
Boston, MA 02111

CIT Bank

27-289/1040

000085

Date  
11/04/2021Check  
000085Pay This Amount  
\$\*\*\*\*\*200.00**Two Hundred and no/100 DOLLARS\*\*\*\*\***

Pay to the order of

Town of Arlington  
PO Box 248  
Arlington, MA 02476-0990*Frank Cotella*

SECURITY FEATURES INCLUDE MICROPRINTING • VOID PANTOGRAPH • ENDORSEMENT BACKER • BROWNSTAIN CHEMICAL REACTANT Authorized Signature - Not Valid after 90 Days

⑈000085⑈ ⑆104002894⑆ 276549766⑈

**Colonial Village Condominium**151 Tremont Street  
Boston, MA 02111

CIT Bank

27-289/1040

000088

Date  
11/16/2021Check  
000088Pay This Amount  
\$\*\*\*\*\*2,237.50**Two Thousand Two Hundred Thirty-Seven and 50/100 DOLLARS\*\*\*\*\***

Pay to the order of

Commonwealth Of  
Massachusetts*Frank Cotella*

SECURITY FEATURES INCLUDE MICROPRINTING • VOID PANTOGRAPH • ENDORSEMENT BACKER • BROWNSTAIN CHEMICAL REACTANT Authorized Signature - Not Valid after 90 Days

⑈000088⑈ ⑆104002894⑆ 276549766⑈

**Colonial Village Condominium**151 Tremont Street  
Boston, MA 02111

CIT Bank

27-289/1040

000089

Date  
11/16/2021Check  
000089Pay This Amount  
\$\*\*\*\*\*2,262.50**Two Thousand Two Hundred Sixty-Two and 50/100 DOLLARS\*\*\*\*\***

Pay to the order of

Town of Arlington  
PO Box 248  
Arlington, MA 02476-0990*Frank Cotella*

SECURITY FEATURES INCLUDE MICROPRINTING • VOID PANTOGRAPH • ENDORSEMENT BACKER • BROWNSTAIN CHEMICAL REACTANT Authorized Signature - Not Valid after 90 Days

⑈000089⑈ ⑆104002894⑆ 276549766⑈



## **SECTION IV**

### **Certified List of Abutters Assessors Map**



Office of the  
Board of Assessors  
Robbins Memorial Town Hall  
Arlington, MA 02476  
(781) 316-3050  
Assessors@town.arlington.ma.us

### **Abutters List**

Date: August 02, 2021

Subject Property Address: COLONIAL VILLAGE DRIVE CONDOMINIUM COMPLEX Arlington, MA  
Subject Property ID: MULTIPLE

Search Distance: 100 Feet

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters within 100 feet of the property lines, of subject property.

A handwritten signature in black ink, appearing to read "Robert E. Greeley". The signature is fluid and cursive, with a long horizontal stroke at the end.

---

**Board of Assessors**



**Abutters List**

Date: August 02, 2021

Subject Property Address: COLONIAL VILLAGE DRIVE  
CONDOMINIUM CONMPLEX Arlington, MA  
Subject Property ID: Multiple

Search Distance: 100 Feet

-----  
Prop ID: 60-1-11.A  
Prop Location: 1395 MASS AVE Arlington, MA  
Owner: SZR ARLINGTON, MA  
Co-Owner: ASSISTED LIVING, L.L.C  
Mailing Address:  
C/O ALTUS/VENTAS #4051  
PO BOX 71970  
PHOENIX, AZ 85050  
-----

Prop ID: 60-2-2  
Prop Location: 14 RESERVOIR RD Arlington, MA  
Owner: WRIGHT BRUCE & SUSAN  
Co-Owner:  
Mailing Address:  
14 RESERVOIR RD  
ARLINGTON, MA 02474  
-----

Prop ID: 60-2-3  
Prop Location: 10 RESERVOIR RD Arlington, MA  
Owner: MARKELZ JOHN W III &  
Co-Owner: MARKELZ MAUREEN A  
Mailing Address:  
10 RESERVOIR RD  
ARLINGTON, MA 02474  
-----

Prop ID: 60-3-1  
Prop Location: 158 LOWELL ST Arlington, MA  
Owner: BOWEN R DAVID  
Co-Owner: BOWEN HEATHER M  
Mailing Address:  
158 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 60-3-2  
Prop Location: 156 LOWELL ST Arlington, MA  
Owner: WOLFE JACK G & KELLY W  
Co-Owner:  
Mailing Address:  
156 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 60-3-6  
Prop Location: 11 RESERVOIR RD Arlington, MA  
Owner: BIALACH ELIZABETH & JAN  
Co-Owner:  
Mailing Address:  
11 RESERVOIR ROAD  
ARLINGTON, MA 02474  
-----

-----  
Prop ID: 60-3-7  
Prop Location: 15 RESERVOIR RD Arlington, MA  
Owner: FISHER ALEXANDRA K/ TRUSTEE  
Co-Owner: ALEXANDRA K FISHER TRUST  
Mailing Address:  
15 RESERVOIR ROAD  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-10  
Prop Location: 182 LOWELL ST Arlington, MA  
Owner: SANTOS-KUSHNIRSKY MARIA B  
Co-Owner:  
Mailing Address:  
182 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-12  
Prop Location: 174 LOWELL ST Arlington, MA  
Owner: CASSIDY NOEL F/TRUSTEE  
Co-Owner: NOEL F CASSIDY REVOCABLE  
Mailing Address:  
174 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-13  
Prop Location: 170 LOWELL ST Arlington, MA  
Owner: HARGRAVE SUSAN  
Co-Owner:  
Mailing Address:  
170 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-14  
Prop Location: 166 LOWELL ST Arlington, MA  
Owner: VALLARINO JOSE A/MARY ALICE  
Co-Owner:  
Mailing Address:  
166 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-15  
Prop Location: 162 LOWELL ST Arlington, MA  
Owner: TUCCITTO SALVATORE  
Co-Owner:  
Mailing Address:  
162 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-2.A  
Prop Location: 176 LOWELL ST Arlington, MA  
Owner: BURGE ROBERT S  
Co-Owner:  
Mailing Address:  
PO BOX 134  
LEXINGTON, MA 02474  
-----

-----  
Prop ID: 61-1-3  
Prop Location: 0-LOT MASS AVE Arlington, MA  
Owner: TOWN OF ARLINGTON PARK  
Co-Owner:  
Mailing Address:  
730 MASS AVE  
ARLINGTON, MA 02476  
-----

Prop ID: 61-1-4  
Prop Location: 0-LOT LOWELL ST Arlington, MA  
Owner: TOWN OF ARLINGTON PARK  
Co-Owner:  
Mailing Address:  
730 MASS AVE  
ARLINGTON, MA 02476  
-----

Prop ID: 61-1-5  
Prop Location: 202 LOWELL ST Arlington, MA  
Owner: YOUNG DOUGLAS W & CATHRINE K  
Co-Owner:  
Mailing Address:  
202 LOWELL STREET  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-6  
Prop Location: 198 LOWELL ST Arlington, MA  
Owner: SCHWARTZ ELIZABETH  
Co-Owner:  
Mailing Address:  
198 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-7  
Prop Location: 194 LOWELL ST Arlington, MA  
Owner: BULL PETER  
Co-Owner: DOIDGE THEA  
Mailing Address:  
194 LOWELL STREET  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-8  
Prop Location: 190 LOWELL ST Arlington, MA  
Owner: FRY JEFFERY &  
Co-Owner: FRY KATE SWEENEY  
Mailing Address:  
190 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-1-9  
Prop Location: 186 LOWELL ST Arlington, MA  
Owner: CONNELL ELLEN H  
Co-Owner:  
Mailing Address:  
186 LOWELL ST  
ARLINGTON, MA 02474  
-----

-----  
Prop ID: 61-2-1  
Prop Location: 167 LOWELL ST Arlington, MA  
Owner: MAGUIRE SUZANNE W  
Co-Owner:  
Mailing Address:  
167 LOWELL STREET  
ARLINGTON, MA 02474  
-----

Prop ID: 61-2-2  
Prop Location: 175 LOWELL ST Arlington, MA  
Owner: HILL GORDON W  
Co-Owner: CARLSON-HILL LISA  
Mailing Address:  
175 LOWELL STREET  
ARLINGTON, MA 02474  
-----

Prop ID: 61-2-2.A  
Prop Location: 169-171 LOWELL ST Arlington, MA  
Owner: CARLSON-HILL LISA K ETAL/ TRS  
Co-Owner: ELNA M CARLSON REVOCABLE TRUST  
Mailing Address:  
175 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-2-3  
Prop Location: 187 LOWELL ST Arlington, MA  
Owner: GRINNELL CHARLES & CAROLINE  
Co-Owner:  
Mailing Address:  
187 LOWELL ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61-2-3.1  
Prop Location: 181 LOWELL ST Arlington, MA  
Owner: GRINNELL CHARLES & CAROLINE  
Co-Owner:  
Mailing Address:  
187 LOWELL ST  
ARLINGTON, MA 02474  
-----

**Prop ID: 61.A-10-1**  
**Prop Location: 10 COLONIAL VILLAGE DR UNIT J1**  
**Arlington, MA**  
**Owner: VALLE ALISON Y**  
**Co-Owner:**  
**Mailing Address:**  
**10 COLONIAL VILLAGE DR #1**  
**ARLINGTON, MA 02474**  
-----

**Prop ID: 61.A-10-10**  
**Prop Location: 10 COLONIAL VILLAGE DR UNIT J10**  
**Arlington, MA**  
**Owner: SULLIVAN ROSEMARY T**  
**Co-Owner:**  
**Mailing Address:**  
**10 COLONIAL VILLAGE DR #10**  
**ARLINGTON, MA 02474**



-----  
Prop ID: 61.A-10-11  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J11  
Arlington, MA  
Owner: GILLIGAN BARBARA YEM- HANG/ TRS  
Co-Owner: BARBARA YEM-HANG GILLIGAN  
Mailing Address:  
10 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-10-12  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J12  
Arlington, MA  
Owner: BRASIL DEASSIS MORAES GUSTAVO  
Co-Owner: SOARES CRISTIANE  
Mailing Address:  
10 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-10-2  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J2  
Arlington, MA  
Owner: IORDANIDIS ATHINA  
Co-Owner:  
Mailing Address:  
10 COLONIAL VILLAGE DR #2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-10-3  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J3  
Arlington, MA  
Owner: ROGERS BRUCE LEE  
Co-Owner: LI JINYU  
Mailing Address:  
107 PINE ST  
WOBBURN, MA 01801-3373  
-----

Prop ID: 61.A-10-4  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J4  
Arlington, MA  
Owner: VAN RHEENEN CONNIE  
Co-Owner:  
Mailing Address:  
38 BRADBURY STREET  
CAMBRIDGE, MA 02138  
-----

Prop ID: 61.A-10-5  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J5  
Arlington, MA  
Owner: ABUGOV GREGORY & VICTORIA  
Co-Owner:  
Mailing Address:  
16 ENDICOTT PL  
CANTON, MA 02021  
-----

-----  
Prop ID: 61.A-10-6  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J6  
Arlington, MA  
Owner: PINE DANIEL R  
Co-Owner:  
Mailing Address:  
51 STOWCROFT RD  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-10-7  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J7  
Arlington, MA  
Owner: HAN XIAOGANG &  
Co-Owner: DONG JENNIFER  
Mailing Address:  
508 LOWELL ST  
LEXINGTON, MA 02420  
-----

Prop ID: 61.A-10-8  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J8  
Arlington, MA  
Owner: LIN ZHOUFANG  
Co-Owner:  
Mailing Address:  
10 COLONIAL VILLAGE DR #8  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-10-9  
Prop Location: 10 COLONIAL VILLAGE DR UNIT J9  
Arlington, MA  
Owner: CHAN MARY KAR-MI  
Co-Owner:  
Mailing Address:  
10 COLONIAL VILLAGE DR #9  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-1-1  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A1  
Arlington, MA  
Owner: BAGWADIA ZUBIN ETAL TR  
Co-Owner: HOPE CYRUS BAGWADIA  
Mailing Address:  
87 OAK RIDGE TER  
LYNNFIELD, MA 01940  
-----

Prop ID: 61.A-1-10  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A10  
Arlington, MA  
Owner: ZHOU XIAOXIONG  
Co-Owner: A/K/A ZHOU FLORA  
Mailing Address:  
6195 HARDY DR  
MCLEAN, VA 22101  
-----

---

Prop ID: 61.A-1-11  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A11  
Arlington, MA  
Owner: BARRY ELLEN J  
Co-Owner:  
Mailing Address:  
1 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474

---

Prop ID: 61.A-11-1  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K1  
Arlington, MA  
Owner: LOPEZ DAVID  
Co-Owner: QUIROS LOURDES  
Mailing Address:  
146 OAKLAND ST  
MALDEN, MA 02148

---

Prop ID: 61.A-11-10  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K10  
Arlington, MA  
Owner: LOPEZ DAVID F  
Co-Owner: QUIROS LOURDES  
Mailing Address:  
146 OAKLAND ST  
MALDEN, MA 02148

---

Prop ID: 61.A-11-11  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K11  
Arlington, MA  
Owner: HIGGINS JAMES F  
Co-Owner:  
Mailing Address:  
4836 COMANCHE TRAIL  
PRESCOTT, AZ 86301

---

Prop ID: 61.A-11-12  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K12  
Arlington, MA  
Owner: WALKER KATHRYN R  
Co-Owner:  
Mailing Address:  
11 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474

---

Prop ID: 61.A-1-12  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A12  
Arlington, MA  
Owner: MA ZHOUYANG  
Co-Owner:  
Mailing Address:  
1 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474

---

---

Prop ID: 61.A-11-2  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K2  
Arlington, MA  
Owner: TIERNEY LAURA J TRUSTEE  
Co-Owner: PIANTES SOUTH MIDDLESEX COUNTY  
Mailing Address:  
216 RANGEWAY RD UNIT 142  
NORTH BILLERICA, MA 01862

---

Prop ID: 61.A-11-3  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K3  
Arlington, MA  
Owner: DIMILLA JULIE ELIZABETH  
Co-Owner:  
Mailing Address:  
11 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474

---

Prop ID: 61.A-11-4  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K4  
Arlington, MA  
Owner: TU WENHONG  
Co-Owner:  
Mailing Address:  
26 SADDLE CLUB RD  
LEXINGTON, MA 02420

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Prop ID: 61.A-11-5  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K5  
Arlington, MA  
Owner: LOPEZ DAVID F  
Co-Owner: QUIROS LOURDES  
Mailing Address:  
146 OAKLAND ST  
MALDEN, MA 02148

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Prop ID: 61.A-11-6  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K6  
Arlington, MA  
Owner: VAN MOORTELT MARJORIE  
Co-Owner:  
Mailing Address:  
11 COLONIAL VILLAGE DR #6  
ARLINGTON, MA 02474

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Prop ID: 61.A-11-7  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K7  
Arlington, MA  
Owner: TU WENJIE  
Co-Owner:  
Mailing Address:  
11 COLONIAL VILLAGE DR #7  
ARLINGTON, MA 02474

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Prop ID: 61.A-11-8  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K8  
Arlington, MA  
Owner: BURKE CHARLES TR  
Co-Owner: TR OF S.R. REALTY TRUST  
Mailing Address:  
C/O LOUIS SARTORI  
11 FAIRWAY DR  
STOW, MA 01775  
-----

Prop ID: 61.A-11-9  
Prop Location: 11 COLONIAL VILLAGE DR UNIT K9  
Arlington, MA  
Owner: VEZNAIAN MARY  
Co-Owner:  
Mailing Address:  
11 COLONIAL VILLAGE DR #9  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-1-2  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A2  
Arlington, MA  
Owner: HERZBERG LORRIE  
Co-Owner:  
Mailing Address:  
1 COLONIAL VILLAGE DR #2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-12-1  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L1  
Arlington, MA  
Owner: SONAM TENZIN  
Co-Owner:  
Mailing Address:  
4 BRIDLE PATH  
SUDBURY, MA 01776  
-----

Prop ID: 61.A-12-10  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L10  
Arlington, MA  
Owner: SHARP JOHN D & KENNETH G/ TRS  
Co-Owner: 2019 CLIFFORD A SHARP  
Mailing Address:  
12 COLONIAL VILLAGE DR  
UNIT 10  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-12-11  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L11  
Arlington, MA  
Owner: MURPHY EDWARD  
Co-Owner:  
Mailing Address:  
12 COLONIAL VILLAGE DR UNIT 11  
ARLINGTON, MA 02474  
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Prop ID: 61.A-12-12  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L12  
Arlington, MA  
Owner: BAI DONGFANG  
Co-Owner: FEI XINGYUAN  
Mailing Address:  
12 COLONIAL VILLAGE DR  
APT 12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-12-2  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L2  
Arlington, MA  
Owner: LAZURE PETER B/ LIFE ESTATE  
Co-Owner:  
Mailing Address:  
12 COLONIAL VILLAGE DR  
UNIT 2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-12-3  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L3  
Arlington, MA  
Owner: DAY STEVEN J  
Co-Owner:  
Mailing Address:  
12 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-12-4  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L4  
Arlington, MA  
Owner: JONES MARILYN J & RICHARD C/ TRS  
Co-Owner: JONES 2020 FAMILY TRUST  
Mailing Address:  
225 PHEASANT AVE  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-12-5  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L5  
Arlington, MA  
Owner: MORILLO-TAYLOR LILIANA  
Co-Owner:  
Mailing Address:  
2675 MONTROSE PL  
SANTA BARBARA, CA 93105  
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Prop ID: 61.A-12-6  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L6  
Arlington, MA  
Owner: KUNWAR CHHABINDRA  
Co-Owner: KUNWAR SUSHMA  
Mailing Address:  
12 COLONIAL VILLAGE DR #6  
ARLINGTON, MA 02474  
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Prop ID: 61.A-12-7  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L7  
Arlington, MA  
Owner: MISAWA TAKAKO  
Co-Owner:  
Mailing Address:  
12 COLONIAL VILLAGE DR #7  
ARLINGTON, MA 02474

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Prop ID: 61.A-12-8  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L8  
Arlington, MA  
Owner: NGUYEN CHIEN VIET  
Co-Owner: VO DUNG NGOC  
Mailing Address:  
12 COLONIAL VILLAGE DR #8  
ARLINGTON, MA 02474

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Prop ID: 61.A-12-9  
Prop Location: 12 COLONIAL VILLAGE DR UNIT L9  
Arlington, MA  
Owner: FERREIRA JOYCE P  
Co-Owner:  
Mailing Address:  
12 COLONIAL VILLAGE DR #9  
ARLINGTON, MA 02474

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Prop ID: 61.A-1-3  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A3  
Arlington, MA  
Owner: FARINO CARLOS  
Co-Owner: FARINO-VIDAL ZORAYDA  
Mailing Address:  
4 SYLVIA ST  
LEXINGTON, MA 02421

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Prop ID: 61.A-1-4  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A4  
Arlington, MA  
Owner: HE JIANG  
Co-Owner: YAO TIANQING  
Mailing Address:  
1 COLONIAL VILLAGE DR  
#4  
ARLINGTON, MA 02474

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Prop ID: 61.A-1-5  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A5  
Arlington, MA  
Owner: WU DAI  
Co-Owner:  
Mailing Address:  
1 COLONIAL VILLAGE DR #5  
ARLINGTON, MA 02474

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Prop ID: 61.A-1-6  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A6  
Arlington, MA  
Owner: CARSER DIANE L  
Co-Owner:  
Mailing Address:  
1 COLONIAL VILLAGE DR #6  
ARLINGTON, MA 02474

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Prop ID: 61.A-1-7  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A7  
Arlington, MA  
Owner: ISMAYLOV DMITRIY  
Co-Owner:  
Mailing Address:  
48 SHADY HILL RD  
WESTON, MA 02493

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Prop ID: 61.A-1-8  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A8  
Arlington, MA  
Owner: WANG PINGLANG & YING  
Co-Owner:  
Mailing Address:  
35 SKYLINE DR  
STATEN ISLAND, NY 10304

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Prop ID: 61.A-1-9  
Prop Location: 1 COLONIAL VILLAGE DR UNIT A9  
Arlington, MA  
Owner: SABIO DARIO R & JOSEFINA B/TRS  
Co-Owner: SABIO FMLY REVOCABLE LIVING TR  
Mailing Address:  
10598 SANTERNO ST  
LAS VEGAS, NV 89141

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Prop ID: 61.A-2-1  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B1  
Arlington, MA  
Owner: DONG JENNIFER Q  
Co-Owner: HAN XIAOGANG  
Mailing Address:  
508 LOWELL ST  
LEXINGTON, MA 02420

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Prop ID: 61.A-2-10  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B10  
Arlington, MA  
Owner: TAM THOMAS &  
Co-Owner: TAM WINNIE YIN  
Mailing Address:  
25 WINCHESTER DRIVE  
LEXINGTON, MA 02420

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Prop ID: 61.A-2-11  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B11  
Arlington, MA  
Owner: RAMSAY RAYLENE L  
Co-Owner:  
Mailing Address:  
2 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-2-12  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B12  
Arlington, MA  
Owner: TANO YUKI NOBU  
Co-Owner:  
Mailing Address:  
2 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-2-2  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B2  
Arlington, MA  
Owner: SQUIRES PROPERTIES LLC  
Co-Owner:  
Mailing Address:  
344 BISHOPS FOREST DR  
WALTHAM, MA 02452  
-----

Prop ID: 61.A-2-3  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B3  
Arlington, MA  
Owner: BERGMAN BRUCE L  
Co-Owner:  
Mailing Address:  
2 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-2-4  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B4  
Arlington, MA  
Owner: LEDDY WILLIAM A  
Co-Owner:  
Mailing Address:  
2 COLONIAL VILLAGE DR #4  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-2-5  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B5  
Arlington, MA  
Owner: ZHANG YUANYE  
Co-Owner: HAO XINMING  
Mailing Address:  
60 ALBEMARLE AVE  
LEXINGTON, MA 02420  
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Prop ID: 61.A-2-6  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B6  
Arlington, MA  
Owner: MORONEY KEVIN F & PAUL R/TRS  
Co-Owner: MORONEY FAMILY REALTY TRUST  
Mailing Address:  
2 COLONIAL VILLAGE DR #6  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-2-7  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B7  
Arlington, MA  
Owner: QUAN SUSAN  
Co-Owner:  
Mailing Address:  
67 SLADE ST  
BELMONT, MA 02478  
-----

Prop ID: 61.A-2-8  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B8  
Arlington, MA  
Owner: WANG ROBERT T & KATHY K/TRS  
Co-Owner: WANG REALTY TRUST  
Mailing Address:  
402 HEATHER DR  
LYNNFIELD, MA 01940  
-----

Prop ID: 61.A-2-9  
Prop Location: 2 COLONIAL VILLAGE DR UNIT B9  
Arlington, MA  
Owner: WANG LIANGYUN  
Co-Owner:  
Mailing Address:  
75 SAINT ALPHONSUS ST  
BOSTON, MA 02120  
-----

Prop ID: 61.A-3-1  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C1  
Arlington, MA  
Owner: COSTA MARIA C  
Co-Owner:  
Mailing Address:  
39 BENTON RD  
SOMERVILLE, MA 02143  
-----

Prop ID: 61.A-3-10  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C10  
Arlington, MA  
Owner: CRONIN WILLIAM E JR  
Co-Owner:  
Mailing Address:  
327 LOWELL ST  
LEXINGTON, MA 02420  
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Prop ID: 61.A-3-11  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C11  
Arlington, MA  
Owner: KINIRY JOHN J JR  
Co-Owner:  
Mailing Address:  
3 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-3-12  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C12  
Arlington, MA  
Owner: YANG YALAN  
Co-Owner:  
Mailing Address:  
3 COLONIAL VILLAGE DR # 12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-3-2  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C2  
Arlington, MA  
Owner: BENNETT FREDERICK  
Co-Owner: BENNETT YUAN WEI MARY  
Mailing Address:  
3 COLONIAL VILLAGE DR #2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-3-3  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C3  
Arlington, MA  
Owner: LEE RICHARD  
Co-Owner:  
Mailing Address:  
3 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-3-4  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C4  
Arlington, MA  
Owner: ARLINGTON COLONIAL LLC  
Co-Owner:  
Mailing Address:  
26 SADDLE CLUB RD  
LEXINGTON, MA 02420  
-----

Prop ID: 61.A-3-5  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C5  
Arlington, MA  
Owner: FENG DUANSI  
Co-Owner:  
Mailing Address:  
3 COLONIAL VILLAGE DR #5  
ARLINGTON, MA 02474  
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Prop ID: 61.A-3-6  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C6  
Arlington, MA  
Owner: THAMES THOMAS L  
Co-Owner: THAMES ELLEN M  
Mailing Address:  
3 COLONIAL VILLAGE DR #6  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-3-7  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C7  
Arlington, MA  
Owner: CAMERON MELANIE  
Co-Owner:  
Mailing Address:  
9 PRINCETON ROAD  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-3-8  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C8  
Arlington, MA  
Owner: WANG ROBERT T & KATHY K/TRS  
Co-Owner: WANG REALTY TRUST  
Mailing Address:  
402 HEATHER RD  
LYNNFIELD, MA 01940  
-----

Prop ID: 61.A-3-9  
Prop Location: 3 COLONIAL VILLAGE DR UNIT C9  
Arlington, MA  
Owner: LARSEN DAVID L  
Co-Owner:  
Mailing Address:  
14 WESTERN AVE UNIT 2  
GLOUCESTER, MA 01930  
-----

Prop ID: 61.A-4-1  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D1  
Arlington, MA  
Owner: JUNG JONATHAN  
Co-Owner:  
Mailing Address:  
4 COLONIAL VILLAGE DR #1  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-4-10  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D10  
Arlington, MA  
Owner: THOMPSON JOHN R & JUDITH  
Co-Owner:  
Mailing Address:  
20 CONNOLLY RD  
BILLERICA, MA 01821  
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Prop ID: 61.A-4-11  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D11  
Arlington, MA  
Owner: ONEIL EMILY  
Co-Owner:  
Mailing Address:  
4 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-4-12  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D12  
Arlington, MA  
Owner: COMMONWEALTH BOSTON REALTY LLC  
Co-Owner:  
Mailing Address:  
111 PERKINS STREET #303  
JAMAICA PLAIN, MA 02130  
-----

Prop ID: 61.A-4-2  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D2  
Arlington, MA  
Owner: COLONIAL VILLAGE CONDOMINIUM  
Co-Owner: TRUST  
Mailing Address:  
C/O DEPT 368 FIRST REALTY MANAGEMENT COR  
PO BOX 4579  
HOUSTON, TX 77210-4579  
-----

Prop ID: 61.A-4-3  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D3  
Arlington, MA  
Owner: JOHNSON CARL R  
Co-Owner:  
Mailing Address:  
75 WILSON RD  
BEDFORD, MA 01730  
-----

Prop ID: 61.A-4-4  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D4  
Arlington, MA  
Owner: KHADKA SANDEEP  
Co-Owner: THAPA SRISHA  
Mailing Address:  
4 COLONIAL VILLAGE DR #4  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-4-5  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D5  
Arlington, MA  
Owner: JENNINGS LAURIE/TRUSTEE  
Co-Owner: SANDRA L FJELD 2017 IRREVOCABL  
Mailing Address:  
4 COLONIAL VILLAGE DR #5  
ARLINGTON, MA 02474  
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Prop ID: 61.A-4-6  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D6  
Arlington, MA  
Owner: MANANDHAR ANILA  
Co-Owner:  
Mailing Address:  
2 ST MARY'S RD  
BURLINGTON, MA 01803  
-----

Prop ID: 61.A-4-7  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D7  
Arlington, MA  
Owner: CHEN YU  
Co-Owner: ZHENG YINGNING  
Mailing Address:  
4 COLONIAL VILLAGE DR #7  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-4-8  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D8  
Arlington, MA  
Owner: XIE CHAO  
Co-Owner: YAN MINGLI  
Mailing Address:  
47 SOMERSET RD  
LEXINGTON, MA 02420  
-----

Prop ID: 61.A-4-9  
Prop Location: 4 COLONIAL VILLAGE DR UNIT D9  
Arlington, MA  
Owner: KIM MYUNG HEE  
Co-Owner:  
Mailing Address:  
131 COOLIDGE AVE UNIT 128  
WATERTOWN, MA 02472-2847  
-----

Prop ID: 61.A-5-1  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E1  
Arlington, MA  
Owner: LEXINGTON REALTY HOLDINGS LLC  
Co-Owner:  
Mailing Address:  
PO BOX 134  
LEXINGTON, MA 02420  
-----

Prop ID: 61.A-5-10  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E10  
Arlington, MA  
Owner: OCALLAGHAN KELLY &  
Co-Owner: SCHNEIDER BRENDYN  
Mailing Address:  
5 COLONIAL VILLAGE DR #10  
ARLINGTON, MA 02474  
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-----  
Prop ID: 61.A-5-11  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E11  
Arlington, MA  
Owner: CHENG HUI  
Co-Owner: WANG HUI  
Mailing Address:  
5 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-5-12  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E12  
Arlington, MA  
Owner: HUANG GRACE  
Co-Owner:  
Mailing Address:  
7 COOK RD  
BURLINGTON, MA 01803  
-----

Prop ID: 61.A-5-2  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E2  
Arlington, MA  
Owner: CARON PROPERTIES LLC  
Co-Owner:  
Mailing Address:  
23 MARRIGAN ST  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-5-3  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E3  
Arlington, MA  
Owner: SMITH IRENE H  
Co-Owner:  
Mailing Address:  
5 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-5-4  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E4  
Arlington, MA  
Owner: JAIN SUJIT G  
Co-Owner: GOLECHA PRATIBHA S  
Mailing Address:  
30 APPLETON PL UNIT 2  
ARLINGTON, MA 02476  
-----

Prop ID: 61.A-5-5  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E5  
Arlington, MA  
Owner: WU PHILIP C  
Co-Owner:  
Mailing Address:  
10 BROADWAY PL APT 3  
SOMERVILLE, MA 02145  
-----

-----  
Prop ID: 61.A-5-6  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E6  
Arlington, MA  
Owner: GROSS GERALDINE R  
Co-Owner:  
Mailing Address:  
5 COLONIAL VILLAGE DR #6  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-5-7  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E7  
Arlington, MA  
Owner: AHMARI SOHRAB  
Co-Owner:  
Mailing Address:  
5 COLONIAL VILLAGE DR #7  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-5-8  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E8  
Arlington, MA  
Owner: MASKEY ANURAG  
Co-Owner: SHRESTHA SHACHI  
Mailing Address:  
47 WALLACE ST  
NEWTON HIGHLANDS, MA 02461  
-----

Prop ID: 61.A-5-9  
Prop Location: 5 COLONIAL VILLAGE DR UNIT E9  
Arlington, MA  
Owner: LAWSON MARTHA A  
Co-Owner:  
Mailing Address:  
70 MT VERNON ST  
HAVERHILL, MA 01830  
-----

Prop ID: 61.A-6-1  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F1  
Arlington, MA  
Owner: MENDEZ VICTOR F  
Co-Owner:  
Mailing Address:  
11 RICHARDSON RD  
STONEHAM, MA 02180  
-----

Prop ID: 61.A-6-10  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F10  
Arlington, MA  
Owner: WOLFE DANIEL P  
Co-Owner:  
Mailing Address:  
6 COLONIAL VILLAGE DR #10  
ARLINGTON, MA 02474  
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Prop ID: 61.A-6-11  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F11  
Arlington, MA  
Owner: HARRIS JEFFREY M  
Co-Owner:  
Mailing Address:  
6 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-6-12  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F12  
Arlington, MA  
Owner: LEE FONG-CHANG  
Co-Owner: LEE SHIU-IN  
Mailing Address:  
C/O JOSEPH LEE  
1531 LUDINGTON AVE  
WESLEY CHAPEL, FL 33543  
-----

Prop ID: 61.A-6-2  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F2  
Arlington, MA  
Owner: CATALDI MAUREEN  
Co-Owner:  
Mailing Address:  
6 COLONIAL VILLAGE DR UNIT 2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-6-3  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F3  
Arlington, MA  
Owner: RANNEY ROGER ERIC  
Co-Owner:  
Mailing Address:  
6 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-6-4  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F4  
Arlington, MA  
Owner: MEI KATHY XIUWEN  
Co-Owner:  
Mailing Address:  
32 ARCOLA ST  
LEXINGTON, MA 02420  
-----

Prop ID: 61.A-6-5  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F5  
Arlington, MA  
Owner: KIM KYUNGSANG  
Co-Owner: SONG DU RI  
Mailing Address:  
6 COLONIAL VILLAGE DR #5  
ARLINGTON, MA 02474  
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-----  
Prop ID: 61.A-6-6  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F6  
Arlington, MA  
Owner: BRIGHTMAN HELEN A  
Co-Owner:  
Mailing Address:  
13 EDSON ST  
NASHUA, NH 03064  
-----

Prop ID: 61.A-6-7  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F7  
Arlington, MA  
Owner: MACAULEY LYNNE A  
Co-Owner: BROWN ROBERT J  
Mailing Address:  
6 COLONIAL VILLAGE DR #7  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-6-8  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F8  
Arlington, MA  
Owner: ZHANG YANFANG  
Co-Owner: CUI JIKE  
Mailing Address:  
78 MAPLE ST  
BELMONT, MA 02478  
-----

Prop ID: 61.A-6-9  
Prop Location: 6 COLONIAL VILLAGE DR UNIT F9  
Arlington, MA  
Owner: PERKINS ELLIOTT W & ANITA C  
Co-Owner: TRS/ PERKINS FAMILY TRUST  
Mailing Address:  
17 STEEPLE CHASE CIRCLE  
WESTFORD, MA 01886  
-----

Prop ID: 61.A-7-1  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G1  
Arlington, MA  
Owner: DAWSON MATTHEW  
Co-Owner:  
Mailing Address:  
7 COLONIAL VILLAGE DR #1  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-7-10  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G10  
Arlington, MA  
Owner: GIOVINAZZO EMMA  
Co-Owner:  
Mailing Address:  
7 COLONIAL VILLAGE DR #10  
ARLINGTON, MA 02474  
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Prop ID: 61.A-7-11  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G11  
Arlington, MA  
Owner: MUSE CAROLYN M & JAMES A  
Co-Owner:  
Mailing Address:  
1 PONDEROSA DR  
PELHAM, NH 03076  
-----

Prop ID: 61.A-7-12  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G12  
Arlington, MA  
Owner: AUSTIN ALEXANDER B  
Co-Owner:  
Mailing Address:  
7 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-7-2  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G2  
Arlington, MA  
Owner: JANTZ JOAN E  
Co-Owner:  
Mailing Address:  
7 COLONIAL VILLAGE DR #2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-7-3  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G3  
Arlington, MA  
Owner: FARRELL MICHAEL W  
Co-Owner: STEIN BRITTANY T  
Mailing Address:  
7 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-7-4  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G4  
Arlington, MA  
Owner: MAUGEL NATHAN/JENNIFER  
Co-Owner:  
Mailing Address:  
60 MUNROE DR  
EAST HAMPSTEAD, NH 03826  
-----

Prop ID: 61.A-7-5  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G5  
Arlington, MA  
Owner: SHIU PLACID K  
Co-Owner:  
Mailing Address:  
19 GRANT PL  
LEXINGTON, MA 02420  
-----

-----  
Prop ID: 61.A-7-6  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G6  
Arlington, MA  
Owner: MUTCH JESSICA E/ TRUSTEE  
Co-Owner: JESSICA E MUTCH REVOCABLE  
Mailing Address:  
21 DEAN ST  
BELMONT, MA 02478  
-----

Prop ID: 61.A-7-7  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G7  
Arlington, MA  
Owner: SIEGEL JULES  
Co-Owner:  
Mailing Address:  
1010 WALTHAM ST APT 295  
LEXINGTON, MA 02421  
-----

Prop ID: 61.A-7-8  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G8  
Arlington, MA  
Owner: ZHANG ZHENZHEN &  
Co-Owner: CHEN KUN  
Mailing Address:  
58 CRESTVIEW RD  
BELMONT, MA 02478  
-----

Prop ID: 61.A-7-9  
Prop Location: 7 COLONIAL VILLAGE DR UNIT G9  
Arlington, MA  
Owner: SWARTS HEIDI  
Co-Owner:  
Mailing Address:  
7 COLONIAL VILLAGE DR #9  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-8-1  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H1  
Arlington, MA  
Owner: LEXINGTON REALTY HOLDINGS LLC  
Co-Owner:  
Mailing Address:  
PO BOX 134  
LEXINGTON, MA 02420  
-----

Prop ID: 61.A-8-10  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H10  
Arlington, MA  
Owner: JONAS MICHAEL  
Co-Owner:  
Mailing Address:  
8 COLONIAL VILLAGE DR #10  
ARLINGTON, MA 02476  
-----

-----  
Prop ID: 61.A-8-11  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H11  
Arlington, MA  
Owner: RAHMATPOUR SOHAILA--ETAL  
Co-Owner: NAKHAE HAMID  
Mailing Address:  
20 OVERBROOK DRIVE  
WELLESLEY, MA 02482  
-----

Prop ID: 61.A-8-12  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H12  
Arlington, MA  
Owner: MILLER CHERYL S  
Co-Owner:  
Mailing Address:  
8 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-8-2  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H2  
Arlington, MA  
Owner: KNIGHT WILL  
Co-Owner:  
Mailing Address:  
8 COLONIAL VILLAGE DR #2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-8-3  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H3  
Arlington, MA  
Owner: TCHOUL SVIATOSLAV  
Co-Owner: TCHOUL OKSANA & MAXIM  
Mailing Address:  
8 COLONIAL VILLAGE DR #3  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-8-4  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H4  
Arlington, MA  
Owner: NADJARIAN VATCHE  
Co-Owner:  
Mailing Address:  
8 COLONIAL VILLAGE DR  
UNIT 4  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-8-5  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H5  
Arlington, MA  
Owner: KING ALLISON J  
Co-Owner:  
Mailing Address:  
32 RIVER ST  
APT 2  
CAMBRIDGE, MA 02139  
-----

-----  
Prop ID: 61.A-8-6  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H6  
Arlington, MA  
Owner: HUEY JEFFREY K  
Co-Owner:  
Mailing Address:  
15 NORTH BEACON ST  
UNIT 507  
ALLSTON, MA 02134  
-----

Prop ID: 61.A-8-7  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H7  
Arlington, MA  
Owner: SHEEHAN KEVIN/ANDREA  
Co-Owner:  
Mailing Address:  
228 FOX HILL RD  
BURLINGTON, MA 01803  
-----

Prop ID: 61.A-8-8  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H8  
Arlington, MA  
Owner: RUSSO ANMARIE  
Co-Owner:  
Mailing Address:  
8 COLONIAL VILLAGE DR #8  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-8-9  
Prop Location: 8 COLONIAL VILLAGE DR UNIT H9  
Arlington, MA  
Owner: LIU QING  
Co-Owner: LI SHUANGLIAN  
Mailing Address:  
8 COLONIAL VILLAGE DR #9  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-1  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I1  
Arlington, MA  
Owner: GOODWIN DESIREE  
Co-Owner:  
Mailing Address:  
9 COLONIAL VILLAGE DR #1  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-10  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I10  
Arlington, MA  
Owner: PRESTON DIANE  
Co-Owner:  
Mailing Address:  
186 NEWPORT ST  
ARLINGTON, MA 02476  
-----



-----  
Prop ID: 61.A-9-11  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I11  
Arlington, MA  
Owner: VALDETTARO VERONIQUE A  
Co-Owner:  
Mailing Address:  
9 COLONIAL VILLAGE DR #11  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-12  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I12  
Arlington, MA  
Owner: FLEMING ELLEN T  
Co-Owner:  
Mailing Address:  
9 COLONIAL VILLAGE DR #12  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-2  
Prop Location: 9 COLONIAL VILLAGE DR UNIT 2  
Arlington, MA  
Owner: NEWMARK GERRY G  
Co-Owner:  
Mailing Address:  
9 COLONIAL VILLAGE DR #2  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-3  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I3  
Arlington, MA  
Owner: ELBANNAN SAMAA  
Co-Owner:  
Mailing Address:  
39 PINE HILL RD  
BEDFORD, MA 01730  
-----

Prop ID: 61.A-9-4  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I4  
Arlington, MA  
Owner: DONOVAN JOANNE  
Co-Owner:  
Mailing Address:  
9 COLONIAL VILLAGE DR #14  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-5  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I5  
Arlington, MA  
Owner: LAI RALPH W M & CINDY S T  
Co-Owner:  
Mailing Address:  
28 CORNERSTONE CT  
DOYLESTOWN, PA 18901  
-----

-----  
Prop ID: 61.A-9-6  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I6  
Arlington, MA  
Owner: WANG PINGLANG & YING  
Co-Owner:  
Mailing Address:  
35 SKYLINE DR  
STATEN ISLAND, NY 10304  
-----

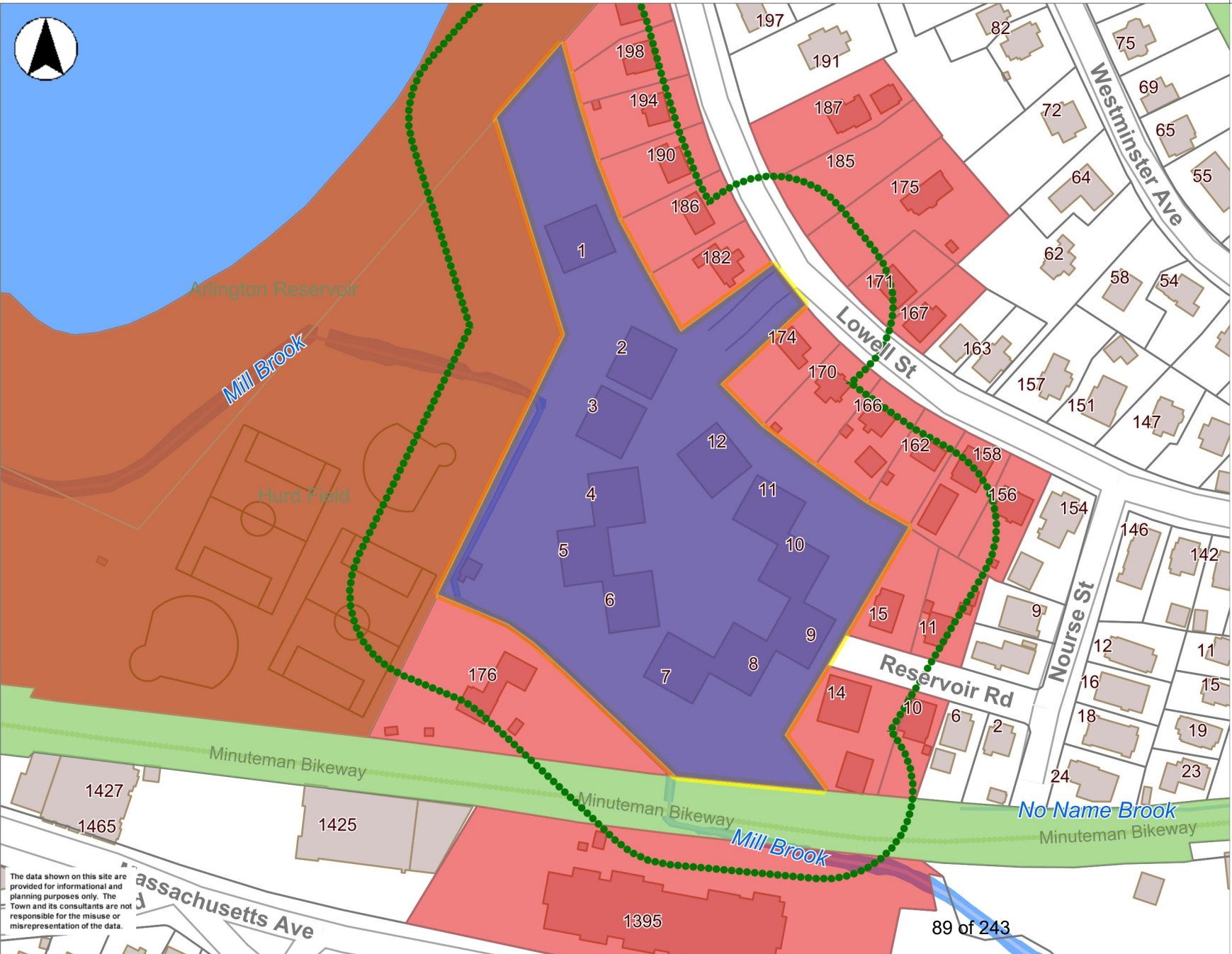
Prop ID: 61.A-9-7  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I7  
Arlington, MA  
Owner: ZHANG YANFANG &  
Co-Owner: CUI JIKE  
Mailing Address:  
78 MAPLE ST  
BELMONT, MA 02478  
-----

Prop ID: 61.A-9-8  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I8  
Arlington, MA  
Owner: SHINGU IKUE  
Co-Owner:  
Mailing Address:  
9 COLONIAL VILLAGE DR #8  
ARLINGTON, MA 02474  
-----

Prop ID: 61.A-9-9  
Prop Location: 9 COLONIAL VILLAGE DR UNIT I9  
Arlington, MA  
Owner: MAC INNES PATRICIA  
Co-Owner:  
Mailing Address:  
32 ST CATHERINE RD  
NORWOOD, MA 02062  
-----



- Places by Category
- Police Station
  - Fire Station
  - School
  - Library
  - Public Works
  - Recreation - Facilities
  - Recreation - Fields Courts
  - Recreation - Fields Courts
  - Open Space: Conservation
  - Open Space - Minuteman
  - Open Space - Labels
  - Open Space
  - Town, State, or Private
  - Other Town Owned
  - MA Highways
  - Interstate
  - US Highway
  - Numbered Routes
  - Abutting Towns
  - Town Boundary
  - Parcels
  - Buildings
  - Cemetery - Roads
  - Road1
  - Road2
  - Road3
  - Road4
  - Pavement Markings
  - Impervious Surface - For B
  - Street
  - Sidewalk
  - Street Island
  - Driveway
  - Parking Lot
  - Bike Path
  - Roads - For Large Scale (f
  - Roads - For Small Scale (f
  - Major Road
  - Local Road
  - Master Plan Base Map - M
  - Water Line
  - Water Body





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January 24, 2022

Mr. David Morgan, Conservation Agent  
Arlington Conservation Commission  
730 Mass Ave. Annex  
Arlington, MA 02476

**RE: Response to Comments from Conservation Commission Members  
Notice of Intent Filing – Colonial Village Drive, Arlington**

On behalf of the applicant, Colonial Village Condominium Trust, McKenzie Engineering Group, Inc. (MEG) is pleased to submit these responses to the comments received from Conservation Commission Members during the January 20, 2022 Public Hearing. The following are the comments with MEG responses in ***bold italics***.

Summary of Comments Provided by Conservation Commission Members:

- TSS removal rate of proposed First Defense HC (FDHC) Stormwater Treatment Devices by Hydro International  
***The New Jersey Department of Environmental Protection (NJDEP) certifies the use of the First Defense HC Stormwater Treatment Device by Hydro International at a TSS removal rate of 50%. Please find the NJDEP certification letter and Verification report by the New Jersey Corporation for Advanced Technology (NJCAT) in Appendix E of report entitled "Drainage Calculations and Stormwater Management Plan", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG.***
- Pollutant capture and retention capabilities of proposed First Defense HC (FDHC) Stormwater Treatment Devices by Hydro International  
***The proposed First Defense Units are designed to capture and retain sediment in the base of the unit, while oil and floatables are stored on the water surface in the inner volume. For more information on the First Defense Unit's pollutant capture and retention capabilities, see the Hydro International First Defense Operation and Maintenance Manual in Appendix E of report entitled "Drainage Calculations and Stormwater Management Plan", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG.***



- Construction Phase Best Management Practices (BMP's)

*The "Construction Phase Pollution Prevention and Erosion and Sedimentation Control Plan (Best Management Practices Operation and Maintenance Plan)" has been updated to reflect only project specific information. The revised Construction Phase Operation and Maintenance Plan can be found in Appendix E of report entitled "Drainage Calculations and Stormwater Management Plan", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG.*

- Post-Development Best Management Practices (BMP's)

*The "Post-Development Best Management Practice Operation and Maintenance Plan & Long-Term Pollution Prevention Plan" has been updated to reflect only project specific information. Frequency of sweeping shall average bi-weekly by a regenerative air sweeper during the time periods specified. See Hydro International First Defense Operation and Maintenance Manual for First Defense inspection requirements. The revised Post-Development Operation and Maintenance Plan can be found in Appendix E of report entitled "Drainage Calculations and Stormwater Management Plan", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG.*

- Bordering Land Subject to Flooding (BLSF) Storage Calculations

*A Compensatory Storage Volume table has been included in Section 2.0 of the project narrative found in report entitled "Notice of Intent", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG. The table shows that the proposed work will result in an increase in flood storage volume for each one-foot interval under the 100-year Base Flood Elevation of 154 feet and a net flood storage volume increase of approximately 1,600 cubic feet.*

- Conformance with the Town of Arlington Regulations for Wetlands Protection

*A description of the project's conformance with the Town of Arlington's Regulations for Wetlands Protection has been included in the project narrative found in report entitled "Notice of Intent", dated December 13, 2021, with latest revision date January 24, 2022, prepared by MEG. Relevant sections from Arlington's Wetlands Protection Regulations include Section 23 – Land Subject to Flooding (Bordering and Isolated), Section 25 – Adjacent Upland Resource Area, and Section 31 – Climate Change Resilience.*

Please contact the undersigned if you require additional information or have any questions that may facilitate your review.

Very truly yours,

MCKENZIE ENGINEERING GROUP, INC.

A handwritten signature in black ink, appearing to read 'Ryan Landers', written in a cursive style.

Ryan Landers, E.I.T.  
Project Engineer

cc: Colonial Village Condominium Trust

**DRAINAGE CALCULATIONS AND  
STORMWATER MANAGEMENT PLAN**

---

***For:***

**COLONIAL VILLAGE DRIVE  
ASSESSORS PARCEL (061.A-1-1 THROUGH 061.A-12-12)  
ARLINGTON, MASSACHUSETTS**

---

***Located:***

**COLONIAL VILLAGE DRIVE  
ARLINGTON, MASSACHUSETTS**

---

***Submitted to:***

**TOWN OF ARLINGTON**

---

***Prepared For:***

**COLONIAL VILLAGE CONDOMINIUM TRUST  
15 TREMONT STREET PH1  
BOSTON, MASSACHUSETTS 02111**

---



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**December 13, 2021  
Revised January 24, 2022**



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## **Drainage Calculations and Stormwater Management Plan Colonial Village Drive Arlington, Massachusetts**

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### **Project Summary**

The project proponent, Colonial Village Condominium Trust, proposes full depth pavement reclamation at Colonial Village Drive in Arlington, Massachusetts. Subject parcel is shown on the Arlington Assessor's Maps as Parcel ID 061.A-1-1 through 061.A-12-12 and is comprised of 4.53 acres. The site is located entirely within the Residence 5 (R5) Zoning District.

The proposed project will consist of the reconstruction of all on-site bituminous concrete parking and access driveways, installation of stormwater management systems and site grading.

The proposed and existing site conditions are illustrated on the project *site plans* entitled "Parking Lot Reconstruction, (APN 061.A-1-1 through 061.A-12-12), Colonial Village Drive, Arlington, Massachusetts", prepared by McKenzie Engineering Group, Inc. dated December 13, 2021, latest revision.

Refer to Figure 1- USGS Locus Map for the location of the parcel.

### **Pre-Development Condition**

The parcel is currently developed consisting of twelve 12-unit condominium buildings, bituminous concrete parking and access driveways, and landscaped areas. The site slopes slightly towards Mill Brook at the southern and western property lines. The topography of the site ranges in elevation from approximately 162 ft. (NAVD 88) at Lowell Street to an elevation of approximately 151 ft. along Mill Brook at the southern and western property lines. Runoff emanating from the site flows in a westerly and southerly direction to the perennial stream, Mill Brook. There are no stormwater treatment measures existing on the site. The landward limits of the Inland Bank on the site were delineated by Environmental Consulting and Restoration, LLC on July 12, 2021. Refer to Appendix D: - Wetland Delineation Report for supporting data.

The site is located within the Zone AE (BFE 154' NAVD88) of the Flood Insurance Rate Map, as shown on the current FEMA Flood Insurance Rate Map Panel No. 25017C0416E with an effective date of June 4, 2010. Refer to Figure 2 – FEMA Flood Map.

The soil types as identified by the Soil Survey, Middlesex County, MA prepared by the NRCS Soil Conservation Service (NRCS) are classified as Hinckley Loamy Sand, 3-8% slopes (SCS 253B) which is classified as hydrologic soil group (HSG A), Urban Land (SCS 602) which has an unclassified HSG, and Merrimac-Urban Land Complex, 0-8% Slopes (SCS 626B) which is classified HSG A. Soil testing conducted by McKenzie Engineering Group, Inc. (MEG) on September 8, 2021 identified the soils to be sandy loam (HSG) C.

Refer to Figure 3 - Soil Map for the NRCS delineation of soil types and Appendix D – Soil Testing Results for supporting data.

### **Post-Development Condition**

The objective in designing the proposed drainage facilities for the project was to maintain existing drainage patterns to the maximum extent practicable and to ensure that runoff from the site is treated before entering Mill Brook by utilizing deep sump hooded catch basins and proprietary pre-treatment units. There will be no change to existing impervious coverage as a result of the parking lot reconstruction. The project is a redevelopment per Standard 7 of the Massachusetts Stormwater Management Standards and is therefore subject to the Standards only to the maximum extent practicable. The proposed project will not obstruct the flow of water or increase flood heights within the flood plain.

### **Stormwater Best Management Practices (BMP's)**

The treatment stream for the redevelopment shall consist of deep sump hooded catch basins and proprietary pre-treatment units to achieve an improvement to existing stormwater drainage conditions to the maximum extent practicable.

### **Erosion and Sedimentation Controls**

Compost filter tube (Silt sock) erosion control barriers will be placed at the limit of work prior to the commencement of any construction activity. The integrity of the silt sock will be maintained by periodic inspection and replacement as necessary. The silt sock will remain in place until the first course of pavement has been placed and all side slopes have been loamed and seeded and vegetation has been established. Refer to the Erosion Control details on the Site Development Plans and BMP Operation and Maintenance Plan for proposed erosion control measures to be employed for the project.

### **Compliance with Stormwater Management Standards**

#### **Standard 1 – No New Untreated Discharges**

The proposed development will not introduce any new untreated discharges to a wetland area or waters of the Commonwealth of Massachusetts. All discharges from the site will be treated through proposed stormwater quality controls such as deep sump hooded catch basins and pre-treatment structures including the establishment of proper maintenance procedures.

#### **Standard 2 – Peak Rate Attenuation**

The proposed redevelopment maintains existing peak rate attenuation and meets existing total impervious areas.

#### **Standard 3 – Groundwater Recharge**

The proposed redevelopment maintains existing groundwater recharge conditions to the maximum extent practicable. The proposed redevelopment does not result in an increase of total impervious areas. Soil testing conducted on-site found groundwater tables to be too high for subsurface infiltration systems to be installed.



#### Standard 4 – Water Quality

The proposed redevelopment improves water quality to the maximum extent practicable by providing proprietary first defense units throughout the parking area. Runoff from reclaimed parking area will be filtered through proprietary first defense units prior to discharging into Mill River.

#### Standard 5 – Land Use with Higher Potential Pollutant Loads (LUHPPL)

The proposed project does not include land uses with higher potential pollutant loads. Not Applicable.

#### Standard 6 – Critical Areas

The proposed project does not lie within a Critical Resource Area. Not applicable.

#### Standard 7 - Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

The proposed project is a redevelopment project and is therefore subject to the Stormwater Management Standards only to the maximum extent practicable.

#### Standard 8 – Construction Period Pollution Prevention and Erosion and Sedimentation Control

The project will require a NPDES Construction General Permit and the preparation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will be submitted prior to any proposed construction. A Construction Phase BMP Operation and Maintenance Plan is included in Appendix E.

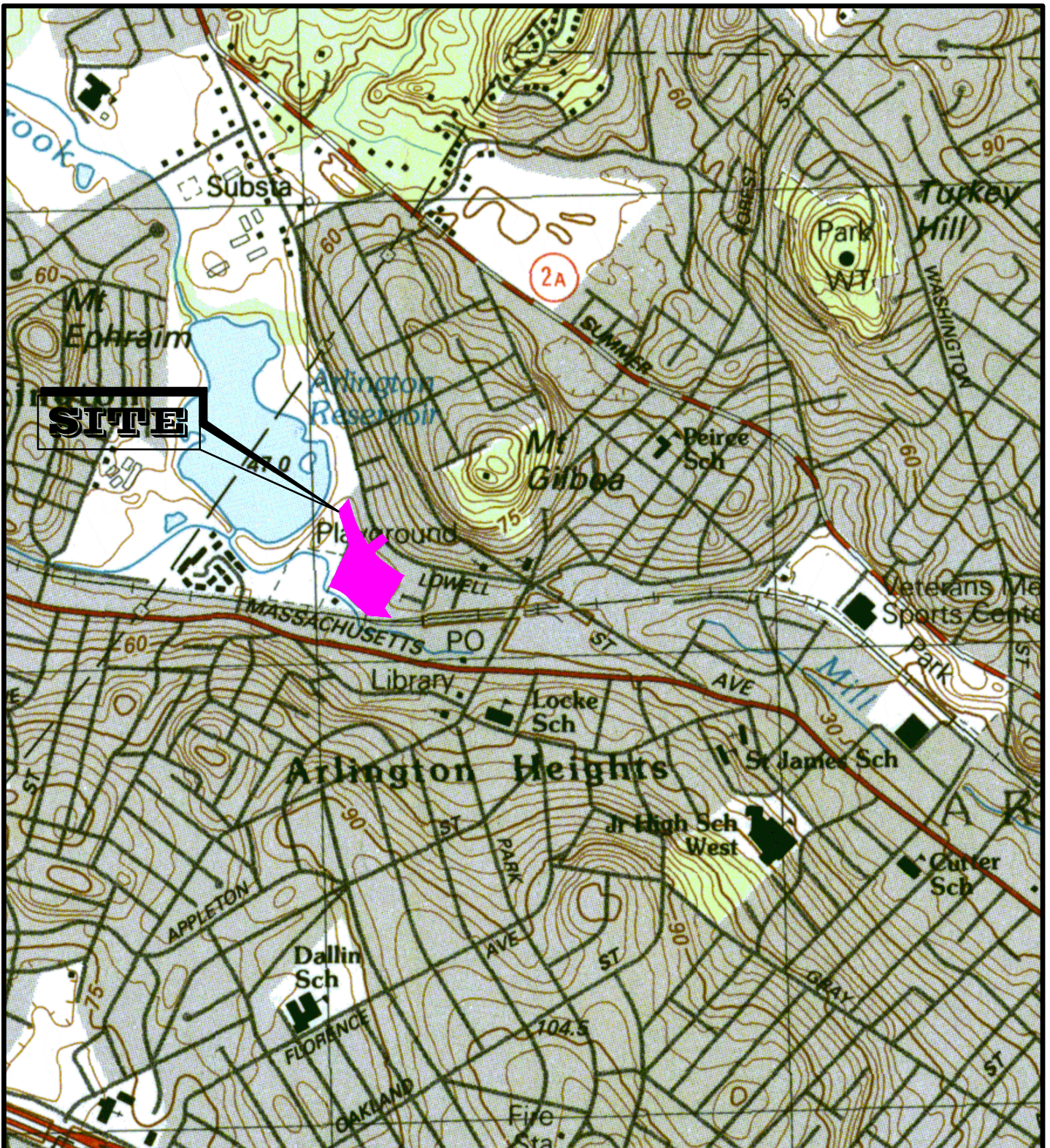
#### Standard 9 – Operation and Maintenance Plan

The Long-Term Operation and Maintenance Plan is provided in Appendix E.

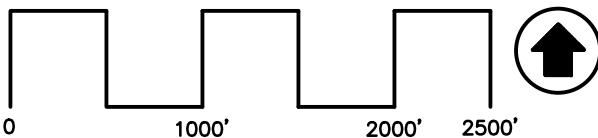
#### Standard 10 – Prohibition of Illicit Discharges

No illicit discharges are anticipated on site. An Illicit Discharge Compliance Statement will be submitted prior to the discharge of any stormwater to the post-construction best management practices. Measures to prevent illicit discharges will be included in the Long-Term Pollution Prevention Plan.





**FIGURE - 1**



U.S. GEOLOGICAL SURVEY  
7.5 X 15 MINUTE SERIES

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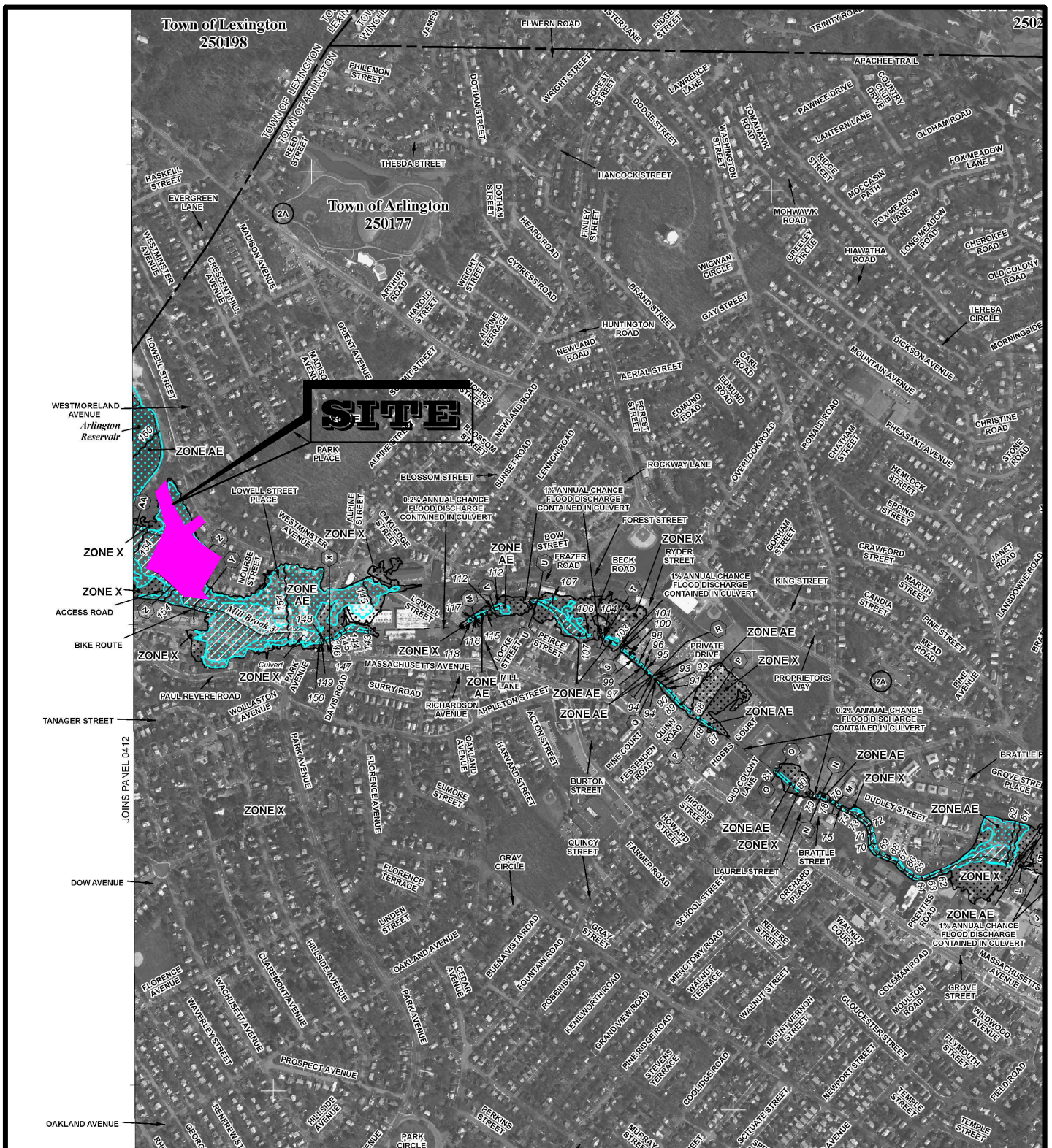
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## USGS LOCUS MAP

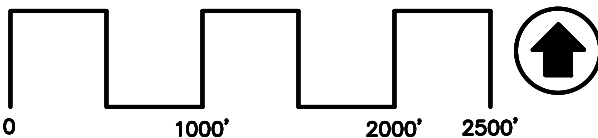
COLONIAL VILLAGE DRIVE  
(APN: 061.A-1-1 THROUGH 061.A12-12)  
ARLINGTON, MASSACHUSETTS

96 of 243





**FIGURE - 2**



COMMUNITY PANEL NO: 25017C0416E  
EFFECTIVE DATE: JUNE 4, 2010

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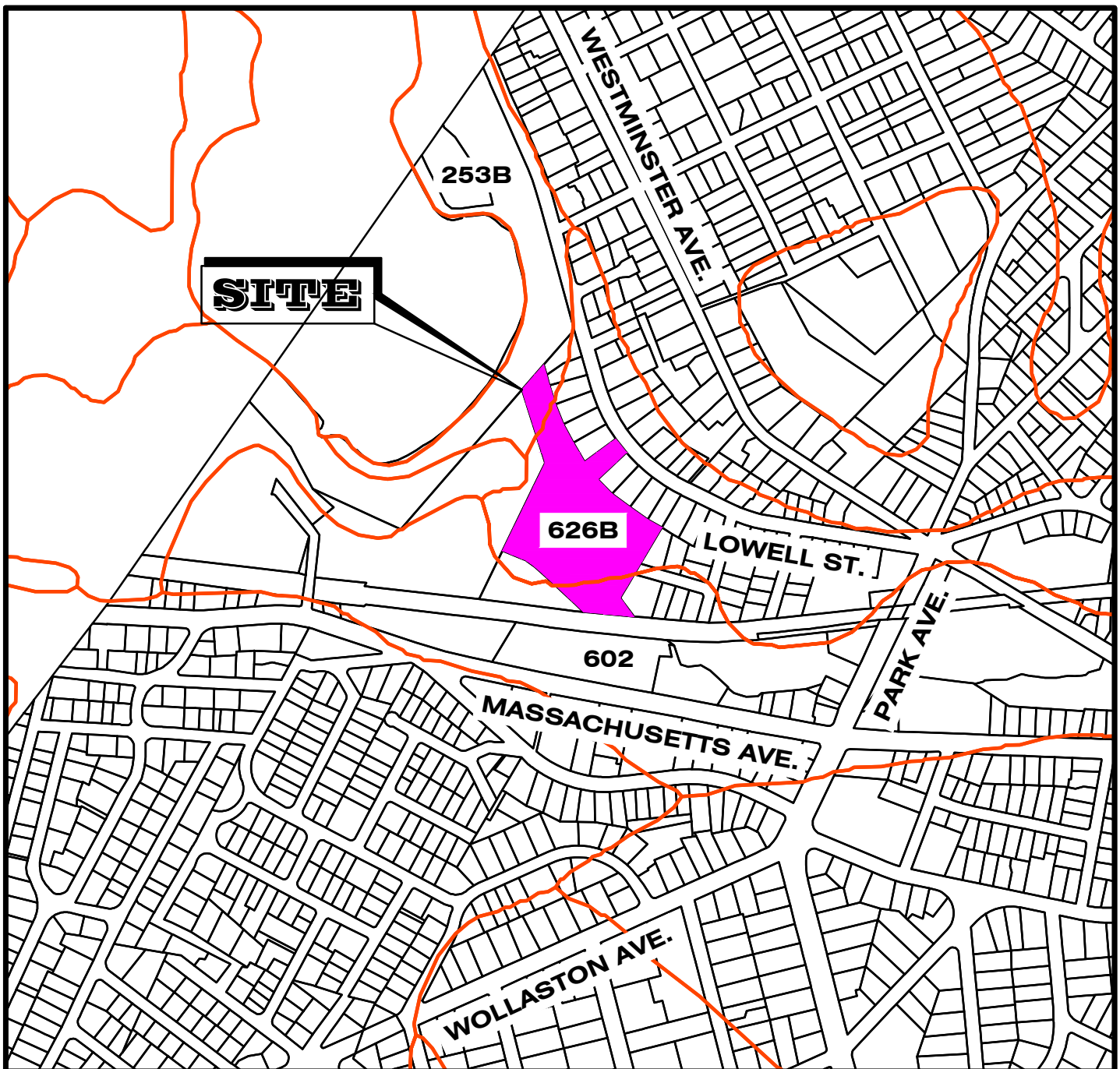


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150 Longwater Drive, Suite 101  
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F: 781.792.0333  
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## FEMA FLOOD MAP

COLONIAL VILLAGE DRIVE  
(APN: 061.A-1-1 THROUGH 061.A12-12)  
ARLINGTON, MASSACHUSETTS

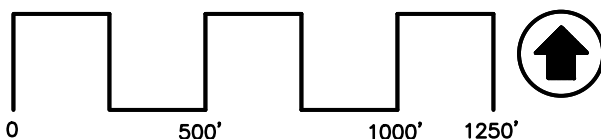




### SOIL KEY

SOIL CLASSIFICATION	DESCRIPTION	HYDROLOGIC SOIL GROUP
253B	HINCKLEY LOAMY SAND, 3-8% SLOPES	A
602	URBAN LAND	UNCLASSIFIED
626B	MERRIMAC-URBAN LAND COMPLEX, 0-8% SLOPES	A

## FIGURE - 3



NRCS SOIL SURVEY  
MIDDLESEX COUNTY



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## NRCS SOILS MAP

COLONIAL VILLAGE DRIVE  
(APN: 061.A-1-1 THROUGH 061.A12-12)  
ARLINGTON, MASSACHUSETTS

## **A P P E N D I X A**

### **Post-Development Condition**





## **A P P E N D I X B**

### **Checklist for Stormwater Report**



# Checklist for Stormwater Report

## A. Introduction

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



# Checklist for Stormwater Report

## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

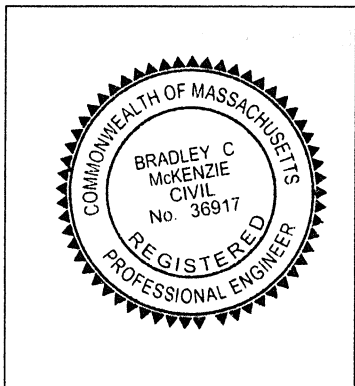
*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

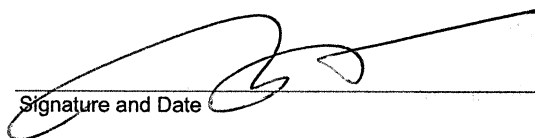
### Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Signature and Date

 12-13-21

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment





# Checklist for Stormwater Report

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## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): \_\_\_\_\_

### Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☐ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
  - ☒ Static
  - ☐ Simple Dynamic
  - ☐ Dynamic Field<sup>1</sup>
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
  - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
  - ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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<sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
  - Provisions for storing materials and waste products inside or under cover;
  - Vehicle washing controls;
  - Requirements for routine inspections and maintenance of stormwater BMPs;
  - Spill prevention and response plans;
  - Provisions for maintenance of lawns, gardens, and other landscaped areas;
  - Requirements for storage and use of fertilizers, herbicides, and pesticides;
  - Pet waste management provisions;
  - Provisions for operation and management of septic systems;
  - Provisions for solid waste management;
  - Snow disposal and plowing plans relative to Wetland Resource Areas;
  - Winter Road Salt and/or Sand Use and Storage restrictions;
  - Street sweeping schedules;
  - Provisions for prevention of illicit discharges to the stormwater management system;
  - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
  - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
  - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
- ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
- ☐ is within the Zone II or Interim Wellhead Protection Area
  - ☐ is near or to other critical areas
  - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
  - ☐ involves runoff from land uses with higher potential pollutant loads.
- ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
- ☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.





# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 4: Water Quality (continued)

- ☐ The BMP is sized (and calculations provided) based on:
  - ☐ The ½" or 1" Water Quality Volume or
  - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

### Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
  - ☐ Limited Project
  - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
  - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
  - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
  - ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
  - Construction Period Operation and Maintenance Plan;
  - Names of Persons or Entity Responsible for Plan Compliance;
  - Construction Period Pollution Prevention Measures;
  - Erosion and Sedimentation Control Plan Drawings;
  - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
  - Vegetation Planning;
  - Site Development Plan;
  - Construction Sequencing Plan;
  - Sequencing of Erosion and Sedimentation Controls;
  - Operation and Maintenance of Erosion and Sedimentation Controls;
  - Inspection Schedule;
  - Maintenance Schedule;
  - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - ☒ Name of the stormwater management system owners;
  - ☒ Party responsible for operation and maintenance;
  - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
  - ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
  - ☐ Description and delineation of public safety features;
  - ☐ Estimated operation and maintenance budget; and
  - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.




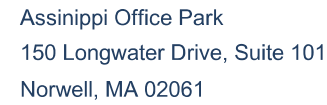
## **A P P E N D I X C**

### **Illicit Discharge Compliance Statement Supplemental BMP Calculations**

## Illicit Discharge Compliance Statement

I, Bradley C. McKenzie, P.E., hereby notify the Arlington Conservation Commission that I have not witnessed, nor am aware of any existing illicit discharges at the site known as APN 061.A-1-1 through 061.A-12-12 in Arlington, Massachusetts. I also hereby certify that the development of said property as illustrated on the final plans entitled "Parking Lot Reconstruction, Colonial Village Drive, (APN 061.A-1-1 through 061.A-12-12), Arlington, Massachusetts," prepared by McKenzie Engineering Group, Inc. dated December 13, 2021 and as revised and approved by the Arlington Conservation Commission and maintenance thereof in accordance with the "Construction Phase Operations and Maintenance Plan" and "Long-Term Operations and Maintenance Plan" prepared by McKenzie Engineering Group, Inc. dated December 13, 2021 and as revised and approved by the Arlington Conservation Commission will not create any new illicit discharges. There is no warranty implied regarding future illicit discharges that may occur as a result of improper construction or maintenance of the stormwater management system or unforeseen accidents.

**Name:** Bradley C. McKenzie, P.E.  
**Company:** McKenzie Engineering Group, Inc.  
**Title:** President  
**Signature:**   
**Date:** 12.13.21



Name:	Colonial Village Drive, Arlington, MA	Proj. No.:	<b>221-155</b>	Design Parameters:	
	APN 061.A-1-1 through 061.A-12-12	Date:	<b>13-Dec-21</b>	100	<b>Year Storm</b> <input type="text" value="Boston, MA"/>
Client:	Colonial Village Condominium Trust	Computed by:	<b>RPL</b>		
		Checked by:	<b>BCM</b>	k <sub>s</sub> =	<b>0.5</b>

NOTE:

FD=First Defense Unit

[illegible]



**Weighted Runoff Coefficients**

Name: Colonial Village Drive, Arlington, MA Proj. No.: 221-155  
APN 061.A-1-1 through 061.A-12-12 Date: 13-Dec-21  
Client: Colonial Village Condominium Trust Computed by: RPL  
Checked by: BCM

FD-1

Description of Area	Area (acres)	Runoff Coefficient	A x C
Pervious	0.000	0.30	0.00
Impervious	0.157	0.90	0.14
Totals =	0.157		0.14

Weighted Runoff Coefficient :  $\Sigma(A \times C) / \Sigma A = 0.90$

FD-3

Description of Area	Area (acres)	Runoff Coefficient	A x C
Pervious	0.000	0.30	0.00
Impervious	0.120	0.90	0.11
Totals =	0.120		0.11

Weighted Runoff Coefficient :  $\Sigma(A \times C) / \Sigma A = 0.90$

FD-5

Description of Area	Area (acres)	Runoff Coefficient	A x C
Pervious	0.000	0.30	0.00
Impervious	0.161	0.90	0.14
Totals =	0.161		0.14

Weighted Runoff Coefficient :  $\Sigma(A \times C) / \Sigma A = 0.90$

## **A P P E N D I X D**

### **Wetland Delineation Report Soil Testing Data**



Environmental Consulting & Restoration, LLC



## WETLAND DELINEATION MEMO

**TO:** McKenzie Engineering Group

**FROM:** Brad Holmes

**DATE:** July 30, 2021

**RE:** Colonial Village, Arlington

Per your request, Environmental Consulting & Restoration, LLC (ECR) performed a review of the existing conditions at the Colonial Village condominium complex located at Colonial Village Drive in Arlington (the Site) on July 12, 2021. The purpose of the review was to identify wetland resource areas on and near the site. The site consists of multiple condominium/apartment buildings with associated paved driveways, parking areas, landscaped areas, etc. The weather on July 12<sup>th</sup> was overcast, warm (approximately 65 degrees), and damp from occasional showers. Wetland resource areas are located on the near western and southern portion of the site associated with a U.S.G.S. mapped perennial stream that flows within a concrete walled stream system. The perennial stream flows from the Arlington Reservoir and is channelized by concrete walls on either side. The concrete walls function as Inland Banks to the stream. There are no vegetated wetlands associated with this stream. For reference, ECR hung Inland Bank flags #IB1 to #IB17 at the top of the Inland Bank/concrete wall of this stream facing the site. As a result of ECR's site, ECR is able to confirm that the site contains the following wetland resource areas and areas of Conservation Commission jurisdiction:

- Inland Bank of a perennial stream
- 100-foot Buffer Zone to Inland Bank
- 200-foot Riverfront Area
- Bordering Land Subject to Flooding (FEMA AE Zone)

Also review of the MassGIS wetlands database reveals the following:

1. The site is not located within Estimated/Priority Habitat for Rare Species according to the Massachusetts Natural Heritage & Endangered Species Program (MaNHESP).
2. The site does not contain Certified Vernal Pools according to the MaNHESP.
3. The site is not located within an Area of Critical Environmental Concern.

Upon review of this wetland delineation memo, please contact me at (617) 529 – 3792 or [brad@ecrwetlands.com](mailto:brad@ecrwetlands.com) with any questions or requests for additional information.

Thank you,  
Brad Holmes, Professional Wetland Scientist #1464  
Manager





Commonwealth of Massachusetts  
City/Town of

## Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

### A. Facility Information

Colonial Village Apt.

Owner Name

1-12 Colonial Village Drive

Street Address

Arlington

City

MA  
State

Parcel ID 061.A-0010-0005.0

Map/Lot #

02474

Zip Code

### B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade ☒ Repair
2. Soil Survey Available? ☒ Yes ☐ No If yes: NRCS 626B  
Source Soil Map Unit
- Merrimac Urban Land complex  
Soil Name
- Loamy glaciofluvial deposits  
Soil Parent material
- None  
Soil Limitations
- Eskers, Outwash plain/terrace  
Landform
3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: 2021 MassGIS Outwash  
Year Published/Source Map Unit
- Outwash plain near Arlington Reservoir  
Description of Geologic Map Unit:
4. Flood Rate Insurance Map Within a regulatory floodway? ☒ Yes ☐ No
5. Within a velocity zone? ☐ Yes ☒ No
6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: Wetland Type
7. Current Water Resource Conditions (USGS): 8/19/21 Range: ☒ Above Normal ☐ Normal ☐ Below Normal  
Month/Day/ Year
8. Other references reviewed: MassGIS, Lexington Well 104



Commonwealth of Massachusetts  
City/Town of

## Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

### C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 1      9/8/21      9:00AM      75 Sunny      42.426°      -71.186°  
Hole #      Date      Time      Weather      Latitude      Longitude:

1. Land Use: Residential      Parking Lot      Some stones      1-3%  
(e.g., woodland, agricultural field, vacant lot, etc.)      Vegetation      Surface Stones (e.g., cobbles, stones, boulders, etc.)      Slope (%)

Description of Location: Parking Lot - South east site

2. Soil Parent Material: Outwash      Outwash plain      FS  
Landform      Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body >100' feet      Drainage Way >100' feet      Wetlands 95' feet  
Property Line 20' feet      Drinking Water Well n/a feet      Other X feet

4. Unsuitable  
Materials Present: ☒ Yes ☐ No      If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No      If yes: 60" Depth Weeping from Pit      60" Depth Standing Water in Hole

#### Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4"	Fill	--	--	-	-	-	----	--	--	--	Parking Lot
4-39"	Fill	--	--	-	-	-	----	--	--	--	Imported Sand
39-45"	Buried A	SL	10YR 2/2	-	-	-	2	2	Gran	Fri	Organic Layer
45-95"	C	GLS	10YR 5/3	45"	2.5YR5/6	2	10	20	Mass	Fri	Stoney LS

Additional Notes: Overall good material - wet substratum, remove buried A



Commonwealth of Massachusetts  
City/Town of

# Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

## C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 2 Hole # 9/8/21 Date 9:30AM Time 75 Sunny Weather 42.426° Latitude -71.186° Longitude:

1. Land Use: Residential (e.g., woodland, agricultural field, vacant lot, etc.) Parking Lot Vegetation Some stones Surface Stones (e.g., cobbles, stones, boulders, etc.) 1-3% Slope (%)

Description of Location: Parking Lot - South site near Brook

2. Soil Parent Material: Outwash Landform Outwash plain Position on Landscape (SU, SH, BS, FS, TS) FS

3. Distances from: Open Water Body >100' feet Drainage Way 30' feet Wetlands 30' feet  
Property Line 20' feet Drinking Water Well n/a feet Other X feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 64" Depth Weeping from Pit 68" Depth Standing Water in Hole

### Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4"	Fill	--	--	-	-	-	----	--	--	--	Parking Lot
4-39"	Fill	--	--	-	-	-	----	--	--	--	Imported Sand/loose
39-45"	Buried A	SL	10YR 2/2	-	-	-	2	2	Gran	Fri	Organic Layer
45-100"	C	LS	10YR 6/2	45"	2.5YR5/6	2	5	20	Mass	Fri	less gravel/ depleted soils

Additional Notes: Overall good material - 4'- C, remove buried A, dryer soil than #1





Commonwealth of Massachusetts  
City/Town of

# Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

## C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 3 Hole # 9/8/21 Date 10:30AM Time 75 Sunny Weather 42.426° Latitude -71.186° Longitude:

1. Land Use: Residential (e.g., woodland, agricultural field, vacant lot, etc.) Parking Lot Vegetation Some stones Surface Stones (e.g., cobbles, stones, boulders, etc.) 1-3% Slope (%)

Description of Location: Parking Lot - South site near bridge

2. Soil Parent Material: Outwash Landform Outwash plain Position on Landscape (SU, SH, BS, FS, TS) FS

3. Distances from: Open Water Body >100' feet Drainage Way 16' feet Wetlands 16' feet  
Property Line 25' feet Drinking Water Well n/a feet Other X feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 38" Depth Weeping from Pit 44" Depth Standing Water in Hole

### Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4"	Fill	--	--	-	-	-	----	--	--	--	Parking Lot
4-22"	Fill	--	10YR4/3	-	-	-	10	20	Mass	Fri	road subgrade/loamy
22-78"	Cd	LS/SL	10YR 5/3	28"	2.5YR5/6	25	10	25	Mass	Fri	Denser Till

Additional Notes: High GW, denser subsurface, likely no room for system



Commonwealth of Massachusetts  
City/Town of

# Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

## C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 4 Hole #      9/8/21 Date      11:15AM Time      75 Sunny Weather      42.426° Latitude      -71.186° Longitude:

1. Land Use: Residential (e.g., woodland, agricultural field, vacant lot, etc.)      Parking Lot Vegetation      Some stones Surface Stones (e.g., cobbles, stones, boulders, etc.)      1-3% Slope (%)

Description of Location: Parking Lot - South site near Brook

2. Soil Parent Material: Outwash Landform      Outwash plain Landform      FS Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body >100' feet      Drainage Way 18' feet      Wetlands 18' feet  
Property Line 30' feet      Drinking Water Well n/a feet      Other X feet

4. Unsuitable Materials Present: ☒ Yes ☐ No      If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No      If yes: 36" Depth Weeping from Pit      43" Depth Standing Water in Hole

### Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4"	Fill	--	--	-	-	-	----	--	--	--	Parking Lot
4-24"	Fill	--	--	-	-	-	----	--	--	--	Imported fill/loam
24-36"	Bw	GLS	10YR 4/3	25"	2.5YR5/6	10	10	10	Mass	Fri	Denser Bw
36-86"	C	GLS	10YR 5/3	-	-	-	20	10	Mass	Fri/Loose	sandy/gravelly

Additional Notes: High GW - Better material than 3, no room for system, potential fill throughout



Commonwealth of Massachusetts  
City/Town of

# Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

## C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 5 Hole #      9/8/21 Date      12:00 PM Time      75 Sunny Weather      42.426° Latitude      -71.186° Longitude:

1. Land Use: Residential (e.g., woodland, agricultural field, vacant lot, etc.)      Parking Lot Vegetation      Some stones Surface Stones (e.g., cobbles, stones, boulders, etc.)      1-3% Slope (%)

Description of Location: Parking Lot - North site near entrance

2. Soil Parent Material: Outwash Landform      Outwash plain Landform      FS Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body >100' feet      Drainage Way >100' feet      Wetlands >100' feet  
Property Line 10' feet      Drinking Water Well n/a feet      Other X feet

4. Unsuitable Materials Present: ☒ Yes ☐ No      If Yes: ☐ Disturbed Soil ☒ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No      If yes: 48" Depth Weeping from Pit      62" Depth Standing Water in Hole

### Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-26"	Fill/A	--	10YR3/2	-	-	-	----	--	--	--	Landscaping
26-40"	Bw	--	10YR4/3	-	-	-	10	5	Mass	Fri	-
40-100"	C	GLS	10YR 5/3	40"	2.5YR5/6	25	15	10	Mass	Fri/loose	Gravelly

Additional Notes: Suitable material for SW, Gravelly C - LS





## Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

### D. Determination of High Groundwater Elevation

1. Method Used: Obs. Hole # All Obs. Hole # \_\_\_\_\_
- ☐ Depth observed standing water in observation hole \_\_\_\_\_ inches \_\_\_\_\_ inches
- ☐ Depth weeping from side of observation hole \_\_\_\_\_ inches \_\_\_\_\_ inches
- ☒ Depth to soil redoximorphic features (mottles) Depth to redox. varies inches \_\_\_\_\_ inches
- ☐ Depth to adjusted seasonal high groundwater ( $S_h$ ) (USGS methodology) \_\_\_\_\_ inches \_\_\_\_\_ inches
- Index Well Number \_\_\_\_\_ Reading Date \_\_\_\_\_
- $S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$
- Obs. Hole/Well# \_\_\_\_\_  $S_c$  \_\_\_\_\_  $S_r$  \_\_\_\_\_  $OW_c$  \_\_\_\_\_  $OW_{max}$  \_\_\_\_\_  $OW_r$  \_\_\_\_\_  $S_h$  \_\_\_\_\_
2. Estimated Depth to High Groundwater: See inches  
logs

### E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material
- a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?
- ☒ Yes ☐ No
- b. If yes, at what depth was it observed (exclude A and O Horizons)?
- c. If no, at what depth was impervious material observed?
- Fill for pavement
- |                 |              |                 |  |
|-----------------|--------------|-----------------|--|
| Upper boundary: | _____ inches | Lower boundary: | <u>4' for all pits</u><br>_____ inches |
| Upper boundary: | _____ inches | Lower boundary: | _____ inches                           |



## Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

### F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Austin Chartier, PE

9/8/2021

Signature of Soil Evaluator

Date

Austin Chartier, PE SE#14167

6/30/2023

Typed or Printed Name of Soil Evaluator / License #

Expiration Date of License

None

N/A

Name of Approving Authority Witness

Approving Authority

**Note:** In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with [Percolation Test Form 12](#).

**Field Diagrams:** Use this area for field diagrams:

## **A P P E N D I X E**

### **Best Management Practices Operation and Maintenance Plans**



**CONSTRUCTION PHASE POLLUTION  
PREVENTION AND EROSION AND  
SEDIMENTATION CONTROL PLAN  
(BEST MANAGEMENT PRACTICES  
OPERATION AND MAINTENANCE PLAN)**

for

**Colonial Village Drive**

In

**Arlington, Massachusetts  
(APN 061.A-1-1 through 061.A-12-12)**

Submitted to:

**TOWN OF ARLINGTON**

Prepared for:

**Colonial Village Condominium Trust  
15 Tremont Street PH1  
Boston, Massachusetts 02111**

Prepared by:



**Professional Civil Engineering • Project Management • Land Planning  
150 Longwater Drive, Suite 101, Norwell, Massachusetts 02061  
Tel.: (781) 792-3900 Facsimile: (781) 792-0333  
[www.mckeng.com](http://www.mckeng.com)**

**December 13, 2021  
Revised January 24, 2022**

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<b>Plans</b>	
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- Site Development Map (Grading and Drainage Plans within Plan Set)	
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- Construction Detail Plan (Construction Details within Plan Set)	

## **Construction Phase Best Management Practices (BMP's)**

Erosion and Sedimentation will be controlled at the site by utilizing Structural Practices, Stabilization Practices, and Dust Control. These practices correspond with plans entitled "Parking Lot Reconstruction, Colonial Village Drive, (APN 061.A-1-1 through 061.A-12-12), Arlington, Massachusetts", issued December 13, 2021 and as revised hereinafter referred to as the Site Plans.

### **Responsible Party Contact Information:**

Stormwater Management System Owner: Colonial Village Condominium Trust  
Alan Foley, Senior Construction Project Manager  
First Realty Management Corporation, AMO  
15 Tremont Street PH1  
Boston, MA 02111  
Phone: (617) 423-7000

### **Town of Arlington Contact Information:**

Arlington Department of Public Works  
51 Grove Street  
Arlington, MA 02476  
Phone: 781-316-3301

Arlington Conservation Commission  
730 Massachusetts Avenue  
Arlington, MA 02476  
Phone: 781-316-3090

Arlington Inspectional Services  
23 Maple Street  
Arlington, MA 02476  
Phone: 781-316-3390

### **Structural Practices:**

- 1) **Compost Filter Tube Barrier Controls** – A compost filter tube barrier will be constructed along downward slopes at the limit of work in locations shown on the plans. This control will be installed prior to major soil disturbance on the site. The sediment silt sack barrier should be installed as shown on the Construction Detail Plan.

#### **Compost Filter Tube Design/Installation Requirements \***

- a) Locate the compost filter tube where identified on the plans.
- b) The compost filter tube line should be nearly level through most of its length to impound a broad, temporary pool. The last 10 to 20 feet at each end of the silt sack should be swung slightly uphill (approximately 0.5 feet in elevation) to provide storage capacity.



- c) The compost filter tube shall be staked every 8 linear feet with 1-inch by 1-inch stakes.
- d) Compost filter tubes should be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized through one growing season. Retained sediment must be removed and properly disposed of, or mulched and seeded.

#### Compost Filter Tube Inspection/Maintenance \*

- a) Compost filter tubes should be inspected immediately after each rainfall event of 1-inch or greater, and at least daily during prolonged rainfall. Inspect the depth of sediment, fabric tears, and to see that the fence posts are firmly in the ground. Repair or replace as necessary.
- b) Remove sediment deposits promptly after storm events to provide adequate storage volume for the next rain and to reduce pressure on the fence. Sediment will be removed from behind the sediment fence when it becomes about ½ foot deep at the compost filter tube. Take care to avoid undermining fence during cleanout.
- c) If the fabric tears, decomposes, or in any way becomes ineffective, replace it immediately.
- d) Remove all compost filter tube materials after the contributing drainage area has been properly stabilized.

- 2) **Sediment Fence Controls** – A sediment fence will be constructed along the limit of work as needed to prevent the spreading of fine sediments from the site. This control will be installed prior to major soil disturbance on the site. The sediment fence should be installed as shown on the Erosion Control Detail Plan and be Amoco woven polypropylene 1198 or equivalent.

#### Sediment Fence Design/Installation Requirements \*

- e) Locate the fence upland of the hay bale barriers and where identified on the plans.
- f) The fence line should be nearly level through most of its length to impound a broad, temporary pool. The last 10 to 20 feet at each end of the fence should be swung slightly uphill (approximately 0.5 feet in elevation) to provide storage capacity.
- g) Excavate a trench approximately 8 inches deep and 4 inches wide, or a V-trench; along the line of the fence, upslope side.
- h) Fasten support wire fence (14 gauge with 6-inch mesh) securely to the upslope side of the fence posts with wire ties or staples. Wire should extend 6 inches into the trench.

- i) Attach continuous length of fabric to upslope side of fence posts. Avoid joints, particularly at low points in the fence line. Where joints are necessary, fasten fabric securely to support posts and overlap to the next post.
- j) Place the bottom one foot of fabric in the trench. Backfill with compacted earth or gravel.
- k) Filter cloth shall be fastened securely to the woven wire fence with ties spaced every 24 inches at the top, mid-section, and bottom.
- l) Sediment fences should be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized through one growing season and only following approval by the Engineering Department or their representative. Retained sediment must be removed and properly disposed of, or mulched and seeded.

#### Sediment Fence Inspection/Maintenance \*

- e) Silt fences should be inspected immediately after each rainfall event of 1-inch or greater, and at least daily during prolonged rainfall. Inspect the depth of sediment, fabric tears, if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground. Repair or replace as necessary.
- f) Remove sediment deposits promptly after storm events to provide adequate storage volume for the next rain and to reduce pressure on the fence. Sediment will be removed from behind the sediment fence when it becomes about ½ foot deep at the fence. Take care to avoid undermining fence during cleanout.
- g) If the fabric tears, decomposes, or in any way becomes ineffective, replace it immediately.
- h) Remove all fencing materials after the contributing drainage area has been properly stabilized.

- 3) **Stabilized Construction Entrance** – A stabilized construction entrance will be placed at the proposed entrance at Lowell Street. The construction entrance will keep mud and sediment from being tracked off the construction site onto Lowell Street by vehicles leaving the site. The stabilized construction entrance will be installed immediately after the clear and grubbing of the roadway entrance and associated roadway fill to maintain access to the site are completed. The stormwater runoff from the entrance will be diverted to a temporary sedimentation basin. The stabilized construction entrance shall be constructed as shown on the Construction Detail Plans.

#### Construction Entrance Design/Construction Requirements \*

- a) Grade foundation for positive drainage towards the temporary sedimentation basin.

- b) Stone for a stabilized construction entrance shall consist of 1 to 3-inch stone placed on a stable foundation.
- c) Pad dimensions: The minimum length of the gravel pad should be 50 feet. The pad should extend the full width of the proposed roadway, or wide enough so that the largest construction vehicle will fit in the entrance with room to spare; whichever is greater.
- d) A geotextile filter fabric shall be placed between the stone fill and the earth surface below the pad to reduce the migration of soil particles from the underlying soil into the stone and vice versa. The filter fabric should be Amoco woven polypropylene 1198 or equivalent.
- e) Washing: If the site conditions are such that the majority of mud is not removed from the vehicle tires by the gravel pad, then the tires should be washed before the vehicle enters the street. The wash area shall be located at the stabilized construction entrance.
- f) Water employed in the washing process shall be directed to the temporary sedimentation basin/dewatering area as shown on the plans prior to discharge. Sediment should be prevented from entering any watercourses.

Construction Entrance Inspection/Maintenance \*

- a) The entrance should be maintained in a condition that will prevent tracking or flowing of sediment onto Lowell Street. This may require periodic topdressing with additional stone
- b) The construction entrance and sediment disposal area shall be inspected weekly and after heavy rains or heavy use.
- c) Mud and sediment tracked or washed onto public road shall be immediately removed by sweeping.
- d) Once mud and soil particles clog the voids in the gravel and the effectiveness of the gravel pad is no longer satisfactory, the pad must be topdressed with new stone. Replacement of the entire pad may be necessary when the pad becomes completely clogged.
- e) If washing facilities are used, the temporary sedimentation basin/dewatering area should be cleaned out as often as necessary to assure that adequate trapping efficiency and storage volume is available. Any water pumped from the temporary sedimentation basin shall be directed into a sediment dirt bag or equivalent inlet protection prior to discharge. Discharge should not be across the disturbed construction site but rather to undisturbed areas.
- f) The pad shall be reshaped as needed for drainage and runoff control.
- g) Broken road pavement on Lowell Street shall be repaired immediately.



- h) All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization is achieved or after the temporary practices are no longer needed and only following approval by the Public Works Department or their representative. Trapped sediment shall be removed or stabilized on site. Disturbed soil areas resulting from removal shall be permanently stabilized.

#### **Stabilization Practices:**

Stabilization measures shall be implemented as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased, with the following exceptions.

- Where the initiation of stabilization measures by the 14<sup>th</sup> day after construction activity temporary or permanently cease is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
- Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of the site by the 14<sup>th</sup> day after construction activity temporarily ceased.
- The contractor shall provide erosion control measures around all soil stockpiles.

#### **Fueling and Maintenance of Equipment and Vehicles:**

1. Refueling/maintenance Rules – The site supervisor shall produce a written document received by all subcontractors and employees that delineates their responsibilities on site. This document shall include language that shall permit the maintenance of vehicles only in designated locations on the job site. In the event of mechanical failure of a vehicle, the vehicle shall be moved to the designated maintenance area on the site to perform maintenance. The site supervisor shall document receipt of these instructions by obtaining the signatures of subcontractors and individuals that may enter the site and the date in which they were notified of their responsibilities. Refueling for vehicles or equipment shall occur either within the designated washout area or shall utilize temporary drip protection measures at the location of fueling. The site supervisor or their representative shall be present at the time of any fueling procedure. The site supervisor shall have a fuel spill plan and measures on site to initiate containment and clean-up in the event a fuel spill occurs.
2. Installation Schedule: Prior to start of Work
3. Maintenance and Inspection: The site supervisor shall maintain a log of individuals receiving these instructions.
4. Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

- a. Description: Fueling operations shall take place in designated area(s) as shown on site maps. Provide temporary drip protection during fueling operations which take place outside of designated area(s). Materials necessary to address a spill shall be made readily available in a location known to the site supervisor or his/her designee.
- b. Installation: Fueling operation procedures shall be in effect throughout the project duration.
- c. Maintenance Requirements: All emergency response equipment listed in the Emergency Response Equipment Inventory shall be made readily available and kept in a designated location known to the site supervisor or his/her designee. All such materials shall be replenished as necessary to the listed amounts.

### **Dust Control:**

Dust control will be utilized throughout the entire construction process of the site. For example, keeping disturbed surfaces moist during windy periods will be an effective control measure, especially for construction access roads. The use of dust control will prevent the movement of soil to offsite areas. However, care must be taken to not create runoff from excessive use of water to control dust. The following are methods of Dust Control that may be used on-site:

- Calcium Chloride – Calcium chloride may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage.
- Sprinkling – The site may be sprinkled until the surface is wet. Sprinkling will be effective for dust control on haul roads and other traffic routes.
- Stone – Stone will be used to stabilize construction roads; will also be effective for dust control.

The general contractor shall employ an on-site water vehicle for the control of dust as necessary.

### **Non-Stormwater Discharges:**

The construction de-watering and all non-stormwater discharges will be directed into a sediment dirt bag (or equivalent inlet protection) or a sediment basin. Sediment material removed shall be disposed of in accordance with all applicable local, state, and federal regulations.

The developer and site general contractor will comply with the E.P.A.'s Final General Permit for Construction De-watering Discharges, (N.P.D.E.S., Section 402 and 40 C.F.R. 122.26(b)(14)(x).

### **Soil Stockpiling:**

Topsoil and subsoil from the driveway grading will be stockpiled in locations shown on the plans.

### Stockpile Material Construction Procedure

- 1) Topsoil and subsoil that are stripped will be stockpiled for later distribution on disturbed areas.
- 2) The stockpiles will be located as shown on the plans. These locations will allow them to not interfere with work on the site.
- 3) Seed the stockpiles with a temporary erosion control mix if the stockpile is to remain undisturbed for more than 30 days. The stockpiles must be stable and the side slopes should not exceed 2:1.
- 4) Sediment Fence/Hay Bale Barrier erosion control measures should be placed surrounding each stockpile.
- 5) As needed, the stockpiled topsoil and subsoil are redistributed throughout the site.

### Anticipated Construction Schedule:

To prevent excessive erosion and silting, the following construction sequence coupled with other widely accepted principals for reducing erosion and sedimentation shall be implemented in the development of the site.

1. Obtain all plan approvals and other applicable permits.
2. Flag the work limits and mark trees and buffer areas for protection.
3. Hold a pre-construction meeting prior to any construction activity.
4. Install stabilization practices for erosion and sediment control prior to commencing construction activities. Refer to "Erosion and Sedimentation Control Plan" and place siltation fence and haybale barriers at locations indicated on the site plans.
5. Clear and grub up as required for the construction of the driveway and related infrastructure.
6. Construct stabilized construction entrance.
7. Excavate topsoil and subsoil from cut and fill areas and stockpile on site in locations shown on the plan. Consideration should be given to locating stockpiles on the uphill side of disturbed areas, where possible, to act as temporary diversions.
8. Install closed drainage system and other utilities. All catch basins shall be covered with siltsack or equivalent inlet protection.
9. Grade driveway to subgrade elevation and construct side slopes. Apply temporary stabilization measures where warranted. Refer to "Erosion and Sedimentation Control Plan".
10. Place gravel subbase.
11. Place the bituminous concrete binder course on driveway and parking lot.
12. Place the final wearing course of pavement.
13. Complete fine grading of shoulders and place pavement in miscellaneous areas.
14. Remove temporary erosion control devices once construction is complete.



### **Inspection/Maintenance:**

Operator personnel must inspect the construction site at least once every 14 calendar days and within 24 hours of a storm event of ½-inch or greater. The applicant shall be responsible to secure the services of a design professional or similar professional (inspector) on an on-going basis throughout all phases of the project. Refer to the Inspection/Maintenance Requirements presented earlier in the “Structural and Stabilization Practices.” The inspector should review the erosion and sediment controls with respect to the following:

- Whether or not the measure was installed/performed correctly.
- Whether or not there has been damage to the measure since it was installed or performed.
- What should be done to correct any problems with the measure.

The inspector should complete the Stormwater Management Construction Phase BMP Inspection Schedule and Evaluation Checklist, as attached, for documenting the findings and should request the required maintenance or repair for the pollution prevention measures when the inspector finds that it is necessary for the measure to be effective. The inspector should notify the appropriate person to make the changes and submit copies of the form to the Arlington Highway Department.

**Project Location: Colonial Village Drive, APN 061.A-1-1 through 061.A-12-12, Arlington, MA Date:**  
**Stormwater Management – Construction Phase**  
**Best Management Practices – Inspection Schedule and Evaluation Checklist**

**Construction Practices**

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed: (List Items)	Date of Cleaning/Repair	Performed by
Silt Sock and Sediment Fence Controls	After heavy rainfall events (minimum weekly)			1. Sediment Fence Design/Installation Requirements 2. Sediment Fence Inspection/Maintenance	<input type="checkbox"/> yes <input type="checkbox"/> no		
Stabilized Construction Entrance	After heavy rainfall events (minimum weekly)			1. Construction Entrance Design/Construction Requirements 2. Construction Entrance Inspection/Maintenance	<input type="checkbox"/> yes <input type="checkbox"/> no		
Dust Control	After heavy rainfall events (minimum weekly)				<input type="checkbox"/> yes <input type="checkbox"/> no		
Soil Stockpiling	After heavy rainfall events (minimum weekly)				<input type="checkbox"/> yes <input type="checkbox"/> no		

(1) Refer to the Massachusetts Stormwater Handbook issued January 2, 2008.

Notes (Include deviations from : Definitive Subdivision Decision and Special Conditions and Approved Plan):

Stormwater Control Manager \_\_\_\_\_

## **Spill Containment and Management Plan**

December 13, 2021

### **Initial Notification**

In the event of a spill, the facility manager will be notified immediately.

Facility Managers (name) Colonial Village Condominium Trust \_\_\_\_\_  
Alan Foley \_\_\_\_\_  
Facility Manager (phone) 617-423-7000 \_\_\_\_\_

### **Assessment - Initial Containment**

The supervisor will assess the incident and initiate containment control measures with the appropriate spill containment equipment included in the spill kit kept on-site. The supervisor will first contact the Fire Department and then notify the Police Department, Department of Public Works, Board of Health and Conservation Commission. The fire department is ultimately responsible for matters of public health and safety and should be notified immediately.

Contact:	Phone Number:
Fire Department:	<u>911</u>
Police Department:	<u>911</u>
Department of Public Works:	<u>(781) 316-3301</u>
Board of Health Phone:	<u>(781) 316-3170</u>
Conservation Commission Phone:	<u>(781) 316-3090</u>

### **Further Notification**

Based on the assessment from the Fire Chief, additional notification to a cleanup contractor may be made. The Massachusetts Department of Environmental Protection (DEP) and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of cleanup and notification required. The attached list of emergency phone numbers shall be posted in the facility office and readily accessible to all employees.



## HAZARDOUS WASTE / OIL SPILL REPORT

Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Time \_\_\_\_ AM / PM

Exact location (Transformer #) \_\_\_\_\_

Type of equipment \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_

S / N \_\_\_\_\_ Weather Conditions \_\_\_\_\_

On or near water ☐ Yes ☐ No If yes, name of body of water \_\_\_\_\_

Type of chemical / oil spilled \_\_\_\_\_

Amount of chemical / oil spilled \_\_\_\_\_

Cause of spill \_\_\_\_\_

\_\_\_\_\_

Measures taken to contain or clean up spill \_\_\_\_\_

\_\_\_\_\_

Amount of chemical / oil recovered \_\_\_\_\_ Method \_\_\_\_\_

Material collected as a result of clean up

\_\_\_\_\_ drums containing \_\_\_\_\_

\_\_\_\_\_ drums containing \_\_\_\_\_

\_\_\_\_\_ drums containing \_\_\_\_\_

Location and method of debris disposal \_\_\_\_\_

\_\_\_\_\_

Name and address of any person, firm, or corporation suffering damages \_\_\_\_\_

\_\_\_\_\_

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring \_\_\_\_\_

\_\_\_\_\_

Spill reported to General Office by \_\_\_\_\_ Time \_\_\_\_\_ AM / PM

Spill reported to DEP / National Response Center by \_\_\_\_\_

DEP Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time \_\_\_\_ AM / PM Inspector \_\_\_\_\_

NRC Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time \_\_\_\_ AM / PM Inspector \_\_\_\_\_

Additional comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## EMERGENCY RESPONSE EQUIPMENT INVENTORY

The following equipment and materials shall be maintained at all times and stored in a secure area for long-term emergency response need.

--	SORBENT PADS	1 BALE
--	SAND BAGS (empty)	5
--	SPEEDI-DRI ABSORBENT	2 – 40LB BAGS
--	12" INFLATABLE PIPE PLUG	1
--	SQUARE END SHOVELS	1
--	PRY BAR	1
--	CATCH BASIN COVER	1

## EMERGENCY NOTIFICATION PHONE NUMBERS

1. FACILITY MANAGER  
NAME: \_\_\_\_\_ BEEPER: \_\_\_\_\_  
PHONE: \_\_\_\_\_ CELL PHONE: \_\_\_\_\_  
  
ALTERNATE:  
NAME: Alan Foley BEEPER: N/A  
PHONE: 617-423-7000 CEL PHONE: N/A
2. FIRE DEPARTMENT  
EMERGENCY: 911  
BUSINESS: (781) 316-3800  
  
POLICE DEPARTMENT  
EMERGENCY: 911  
BUSINESS: (781) 643-1212  
  
DEPARTMENT OF PUBLIC WORKS  
CONTACT: Michael Rademacher, Director  
BUSINESS: (781) 316-3104  
ALTERNATE: (781) 316-3301  
  
CONSERVATION COMMISSION  
CONTACT: Susan Chapnick, Chair  
BUSINESS: (781) 316-3090  
  
BOARD OF HEALTH  
CONTACT: Natasha Waden, Director  
BUSINESS: (781) 316-3170
3. MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
EMERGENCY: (888) 304-1133  
NORTHEAST REGION - WILMINGTON OFFICE: (978) 694-3200
4. NATIONAL RESPONSE CENTER  
PHONE: (800) 424-8802  
  
ALTERNATE: U.S. ENVIRONMENTAL PROTECTION AGENCY  
EMERGENCY: (617) 223-7265  
BUSINESS: (617) 860-4300

**POST-DEVELOPMENT BEST MANAGEMENT  
PRACTICE  
OPERATION AND MAINTENANCE PLAN &  
LONG-TERM POLLUTION PREVENTION PLAN**

for

**Colonial Village Drive**

In

**Arlington, Massachusetts  
(APN 061.A-1-1 through 061.A-12-12)**

Submitted to:

**TOWN OF ARLINGTON**

Prepared for:

**Colonial Village Condominium Trust  
15 Tremont Street PH1  
Boston, Massachusetts 02111**

Prepared by:



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**December 13, 2021  
Revised January 24, 2022**



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**Post-Development Best Management Practice**  
**Operation and Maintenance Plan &**  
**Long-Term Pollution Prevention Plan**

**Post-Development Best Management Practices (BMPs)**  
**Operation and Maintenance Plan**

Responsible Party/Property Owner/Developer contact information:

Property Owner: Colonial Village Condominium Trust  
15 Tremont Street PH1  
Boston, MA 02111

Developer Contact Information:

Colonial Village Condominium Trust  
Alan Foley, Senior Construction Project Manager  
First Realty Management Corporation, AMO  
15 Tremont Street PH1  
Boston, MA 02111  
Phone: (617) 423-7000

Best Management Practices (BMPs) of the Commonwealth of Massachusetts Department of Environmental Protection's (DEP's) Stormwater Management Policy (SMP) have been implemented and utilized for the project. The following information provided is to be used as a guideline for monitoring and maintaining the performance of the drainage facilities and to ensure that the quality of water runoff meets the standards set forth by the SMP. The structural Best Management Practices (BMPs) shall be inspected during rainfall conditions during the first year of operation to verify functionality.

BMPs included in the design consist of the use of:

- Paved areas maintenance
- Deep sump catch basins with hooded outlets
- Proprietary pretreatments units
- Restrictions on the use of pesticides and herbicides within the 100-foot buffer zone
- Snow removal

**Operation:**

Once the stormwater management systems have been constructed and the driveway and parking lot has been permanently stabilized and put into action, the operation of the stormwater management system will function as intended. Stormwater runoff is directed into the catch basins and closed drainage system to the First Defense units, and lastly discharged into Mill Brook.

**Maintenance:**

1. **Paved Areas** –Sweepers shall sweep paved areas periodically during dry weather to remove excess sediments and to reduce the amount of sediments that the drainage

system shall have to remove from the runoff. The sweeping shall be conducted primarily between March 15<sup>th</sup> and November 15<sup>th</sup>. Special attention should be made to sweeping paved surfaces in March and April before spring rains wash residual sand into the drainage system.

The frequency of sweeping shall average:

- Bi-weekly by a regenerative air sweeper

Salt used for de-icing on the parking lot during winter months shall be limited as much as possible as this will reduce the need for removal and treatment. Sand containing the minimum amount of calcium chloride (or approved equivalent) needed for handling may be applied as part of the routine winter maintenance activities.

Cost: The property owner should consult local sweeping contractors for detailed cost estimates.

- 2. Catch Basins** - Catch basin grates shall be checked quarterly and following heavy rainfalls to verify that the inlet openings are not clogged by debris. Debris shall be removed from the grates and disposed of properly. Deep sump catch basins shall be inspected and cleaned bi-annually of all accumulated sediments. Catch basins with hoods shall be inspected annually to check oil build-up and outlet obstructions. Material shall be removed from catch basins and disposed of in accordance with all applicable regulations.

Cost: Estimated \$50 - \$100 per cleaning as needed. The property owner should consult local vacuum cleaning contractors for detailed cost estimates.

- 3. Proprietary Pretreatment Units** – The proprietary pretreatment units shall be inspected and maintained from the surface, without entry into the unit a minimum of annually and following heavy rain events. Perform maintenance once the stored volume reaches 15% of the unit capacity, or immediately in the event of a spill. Perform Maintenance at quarterly intervals during the first year of installation, so an accurate maintenance schedule can be established. Sediment and debris should be removed through the 12-inch diameter outlet pipe. Alternatively, oil and floatables should be removed through the 12-inch oil inspection port. The requirements for the disposal from the units should be in compliance with all local, state and federal regulations. Please refer to the Manufacturer's Manual for additional detail on proper inspection and maintenance of the First Defense units.

Cost: Cleaning should be included along with the routine maintenance of the catch basins. The property owner should consult local vacuum cleaning contractors for detailed cost estimates.

- 4. Pesticides, Herbicides, and Fertilizers** - Pesticides and herbicides shall be used sparingly. Fertilizers should be restricted to the use of organic fertilizers only.

All structural BMP's as identified on the site plans will be owned and maintained by the homeowner's association of the development and shall run with the title of the property.

Cost: Included in the routine landscaping maintenance schedule. The Owner should consult local landscaping contractors for details.

- 5. Snow Removal** - Snow accumulations removed from driveway and parking areas should be placed in upland areas only, where sand and other debris will remain after snowmelt for later removal. Excess snow should be removed from the site and

properly disposed of in an approved snow disposal facility. Care must be exercised not to deposit snow in areas where sand and debris can get into the watercourse.

Cost: The owner should consult local snow removal contractors for a detailed cost estimate.

### **Maintenance Responsibilities:**

All post construction maintenance activities will be documented and kept on file in the form of an Evaluation Checklist, see attached form.

All structural BMPs as identified on the site plans will be owned and maintained by the developer or property owner. All post construction maintenance activities shall run with the title of the property.

### **Long-Term Pollution Prevention Plan**

#### **Good Housekeeping:**

To develop and implement an operation and maintenance program with the goal of preventing or reducing pollutant runoff by keeping potential pollutants from coming into contact with stormwater or being transported off site without treatment, the following efforts will be made:

- Property Management awareness and training on how to incorporate pollution prevention techniques into maintenance operations.
- Follow appropriate best management practices (BMPs) by proper maintenance and inspection procedures.

#### **Storage and Disposal of Household Waste and Toxics:**

This management measure involves educating the general public on the management considerations for hazardous materials. Failure to properly store hazardous materials dramatically increases the probability that they will end up in local waterways. Many people have hazardous chemicals stored throughout their homes, especially in garages and storage sheds. Practices such as covering hazardous materials or even storing them properly, can have dramatic impacts. Property owners are encouraged to support the household hazardous product collection events sponsored by the Town of Arlington.

MADEP has prepared several materials for homeowners on how to properly use and dispose of household hazardous materials:

**<http://www.mass.gov/dep/recycle/reduce/househol.htm>**

For consumer questions on household hazardous waste call the following number:

**DEP Household Hazardous Waste Hotline      800-343-3420**

The following is a list of management considerations for hazardous materials as outlined by the EPA:

- Ensuring sufficient aisle space to provide access for inspections and to improve the ease of material transport;
- Storing materials well away from high-traffic areas to reduce the likelihood of accidents that might cause spills or damage to drums, bags, or containers.



- Stacking containers in accordance with the manufacturers' directions to avoid damaging the container or the product itself;
- Storing containers on pallets or equivalent structures. This facilitates inspection for leaks and prevents the containers from coming into contact with wet floors, which can cause corrosion. This consideration also reduces the incidence of damage by pests.

The following is a list of commonly used hazardous materials used in the household:

Batteries – automotive and rechargeable	Disinfectant
.....nickel cadmium batteries	Drain clog dissolvers
.....(no alkaline batteries)	Driveway sealer
Gasoline	Flea dips, sprays and collars
Oil-based paints	Houseplant insecticides
Fluorescent light bulbs and lamps	Metal polishes
Pool chemicals	Mothballs
Propane tanks	Motor oil and filters
Lawn chemicals,	Muriatic acid (concrete cleaner)
fertilizers and weed killers	Nail polishes and nail polish
Turpentine	removers
Bug sprays	Oven cleaner
Antifreeze	Household pest and rat poisons
Paint thinners, strippers, varnishes and	Rug and upholstery cleaners
..... stains	Shoe polish
Arts and crafts chemicals	Windshield wiper fluid
Charcoal lighter fluid	

### **Vehicle Washing:**

This management measure involves educating the general public on the water quality impacts of the outdoor washing of automobiles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor car washing has the potential to result in high loads of nutrients, metals, and hydrocarbons during dry weather conditions in many watersheds, as the detergent-rich water used to wash the grime off our cars flows down the street and into the storm drain. The following management practices will be encouraged:

- Washing cars on gravel, grass, or other permeable surfaces.
- Blocking off the storm drain during car washing and redirecting wash water onto grass or landscaping to provide filtration.
- Using hoses with nozzles that automatically turn off when left unattended.
- Using only biodegradable soaps.
- Minimize the amounts of soap and water used. Wash cars less frequently.
- Promote use of commercial car wash services.

### **Landscape Maintenance:**

This management measure seeks to control the storm water impacts of landscaping and

lawn care practices through education and outreach on methods that reduce nutrient loadings and the amount of storm water runoff generated from lawns. Nutrient loads generated by fertilizer use on suburban lawns can be significant, and recent research has shown that lawns produce more surface runoff than previously thought.

Using proper landscaping techniques can effectively increase the value of a property while benefiting the environment. These practices can benefit the environment by reducing water use; decreasing energy use (because less water pumping and treatment is required); minimizing runoff of storm and irrigation water that transports soils, fertilizers, and pesticides; and creating additional habitat for plants and wildlife. The following lawn and landscaping management practices will be encouraged:

- Mow lawns at the highest recommended height.
- Minimize lawn size and maintain existing native vegetation.
- Collect rainwater for landscaping/gardening needs (rain barrels and cisterns to capture roof runoff).
- Raise public awareness for promoting the water efficient maintenance practices by informing users of water efficient irrigation techniques and other innovative approaches to water conservation.
- Abide by water restrictions and other conservation measures implemented by the Town of Arlington.
- Water only when necessary.
- Use automatic irrigation systems to reduce water use.

#### **Integrated Pest Management (IPM):**

This management measure seeks to limit the adverse impacts of insecticides and herbicides by providing information on alternative pest control techniques other than chemicals or explaining how to determine the correct dosages needed to manage pests.

The presence of pesticides in stormwater runoff has a direct impact on the health of aquatic organisms and can present a threat to humans through contamination of drinking water supplies. The pesticides of greatest concern are insecticides, such as diazinon and chlorpyrifos, which even at very low levels can be harmful to aquatic life. The major source of pesticides to urban streams is home application of products designed to kill insects and weeds in the lawn and garden. The following IPM practices will be encouraged:

- Lawn care and landscaping management programs including appropriate pesticide use management as part of program.
- Raise public awareness by referring homeowners to “A Homeowner’s Guide to Environmentally Sound Lawncare, Maintaining a Healthy Lawn the IPM Way”, Massachusetts Department of Food and Agriculture, Pesticide Bureau or link <http://www.mass.gov/dep/water/resources/nonpoint.htm#megaman>>

**Pet Waste Management:**

Pet waste management involves using a combination of pet waste collection programs, pet awareness and education, to alert residents to the proper disposal techniques for pet droppings. The following management practices will be encouraged:

- Raise awareness of homeowners that are also pet owners that they are encouraged to pick up after their pets and dispose of the waste either in the trash, including on their own lawns and walking trails.
- Provide signage along walking trails.

**Proper Management of Deicing Chemicals and Snow:**

Roadways shall be maintained by the Developer/Property Owners. The following deicing chemicals and snow storage practices will be encouraged:

- Select effective snow disposal sites adjacent to or on pervious surfaces in upland areas away from water resources and wells. At these locations, the snow meltwater can filter into the soil, leaving behind sand and debris, which can be removed in the springtime.
- No roadway deicing materials shall be stockpiled on site unless all storage areas are protected from exposure to rain, snow, snowmelt and runoff.
- Avoid dumping snow into any waterbody.
- Avoid disposing of snow on top of storm drain catch basins.

**Project Location: Colonial Village Drive, APN 061.A-1-1 through 061.A-12-12, Arlington, MA**

**Stormwater Management – Post Construction Phase**

**Best Management Practices – Inspection Schedule and Evaluation Checklist**

**Long Term Practices**

Best Management Practice	Inspection Frequency (1)	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check (1)	Cleaning/Repair Needed: <input type="checkbox"/> yes <input type="checkbox"/> no (List Items)	Date of Cleaning/Repair	Performed by
Street Sweeping Maintenance	Bi-weekly from March 15 <sup>th</sup> to November 15 <sup>th</sup>			1. Sediment build-up 2. Trash and debris 3. Minor Spills (vehicular)			
Proprietary Pretreatment Units	After heavy rainfall events (minimum annually)			1. Sediment level exceeds Manufacturer's specification 2. Trash and debris 3. Floatable oils or hydrocarbons 4. Outlet and grate blockages			

**(1) Refer to the Massachusetts Stormwater Management, Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspection and maintenance of specific BMP's.**

**Notes (Include deviations from: Con Com Order of Conditions, PB Approval, Construction Sequence and Approved Plan):**

1.

Stormwater Control Manager \_\_\_\_\_

Stamp:



## **Spill Containment and Management Plan**

December 13, 2021

### **Initial Notification**

In the event of a spill, the facility manager will be notified immediately.

Facility Managers (name) Colonial Village Condominium Trust \_\_\_\_\_  
Alan Foley \_\_\_\_\_  
Facility Manager (phone) 617-423-7000 \_\_\_\_\_

### **Assessment - Initial Containment**

The supervisor will assess the incident and initiate containment control measures with the appropriate spill containment equipment included in the spill kit kept on-site. The supervisor will first contact the Fire Department and then notify the Police Department, Department of Public Works, Board of Health and Conservation Commission. The fire department is ultimately responsible for matters of public health and safety and should be notified immediately.

Contact:	Phone Number:
Fire Department:	<u>911</u>
Police Department:	<u>911</u>
Department of Public Works:	<u>(781) 316-3301</u>
Board of Health Phone:	<u>(781) 316-3170</u>
Conservation Commission Phone:	<u>(781) 316-3090</u>

### **Further Notification**

Based on the assessment from the Fire Chief, additional notification to a cleanup contractor may be made. The Massachusetts Department of Environmental Protection (DEP) and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of cleanup and notification required. The attached list of emergency phone numbers shall be posted in the facility office and readily accessible to all employees.

## HAZARDOUS WASTE / OIL SPILL REPORT

Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Time \_\_\_\_ AM / PM

Exact location (Transformer #) \_\_\_\_\_

Type of equipment \_\_\_\_\_ Make \_\_\_\_\_ Size \_\_\_\_\_

S / N \_\_\_\_\_ Weather Conditions \_\_\_\_\_

On or near water ☐ Yes ☐ No If yes, name of body of water \_\_\_\_\_

Type of chemical / oil spilled \_\_\_\_\_

Amount of chemical / oil spilled \_\_\_\_\_

Cause of spill \_\_\_\_\_

\_\_\_\_\_

Measures taken to contain or clean up spill \_\_\_\_\_

\_\_\_\_\_

Amount of chemical / oil recovered \_\_\_\_\_ Method \_\_\_\_\_

Material collected as a result of clean up

\_\_\_\_\_ drums containing \_\_\_\_\_

\_\_\_\_\_ drums containing \_\_\_\_\_

\_\_\_\_\_ drums containing \_\_\_\_\_

Location and method of debris disposal \_\_\_\_\_

\_\_\_\_\_

Name and address of any person, firm, or corporation suffering damages \_\_\_\_\_

\_\_\_\_\_

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring \_\_\_\_\_

\_\_\_\_\_

Spill reported to General Office by \_\_\_\_\_ Time \_\_\_\_\_ AM / PM

Spill reported to DEP / National Response Center by \_\_\_\_\_

DEP Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time \_\_\_\_ AM / PM Inspector \_\_\_\_\_

NRC Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time \_\_\_\_ AM / PM Inspector \_\_\_\_\_

Additional comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## EMERGENCY RESPONSE EQUIPMENT INVENTORY

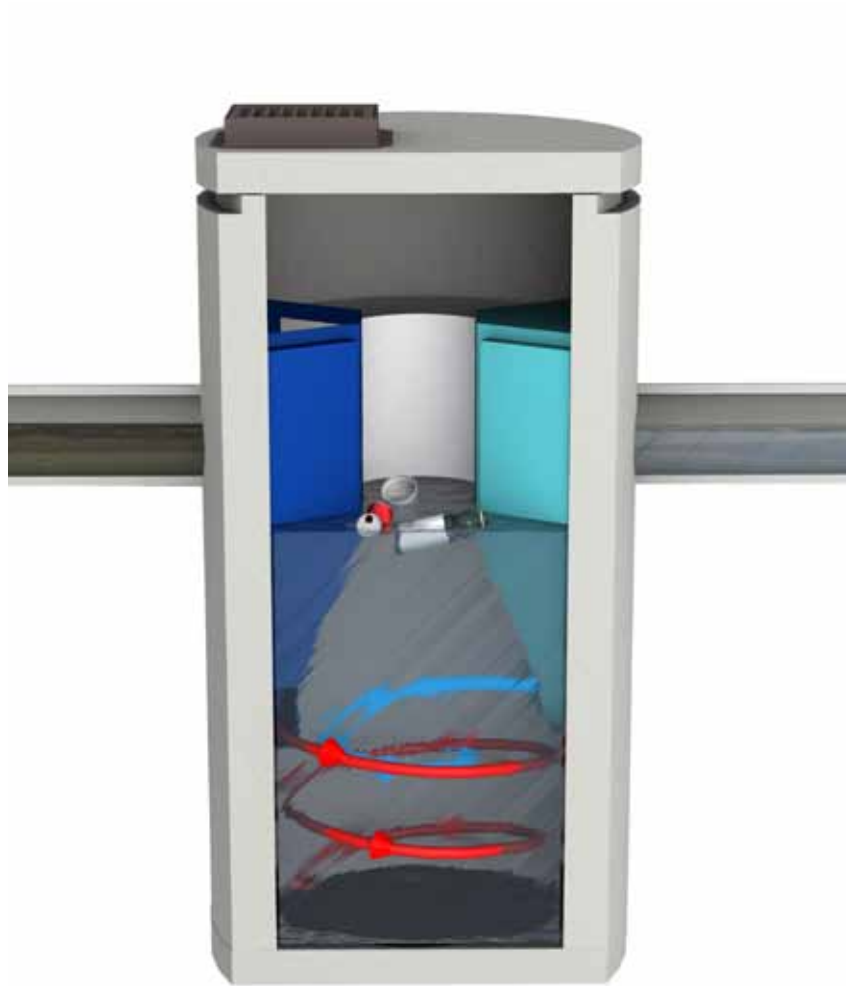
The following equipment and materials shall be maintained at all times and stored in a secure area for long-term emergency response need.

--	SORBENT PADS	1 BALE
--	SAND BAGS (empty)	5
--	SPEEDI-DRI ABSORBENT	2 – 40LB BAGS
--	12" INFLATABLE PIPE PLUG	1
--	SQUARE END SHOVELS	1
--	PRY BAR	1
--	CATCH BASIN COVER	1

## EMERGENCY NOTIFICATION PHONE NUMBERS

1. FACILITY MANAGER  
NAME: \_\_\_\_\_ BEEPER: \_\_\_\_\_  
PHONE: \_\_\_\_\_ CELL PHONE: \_\_\_\_\_  
  
ALTERNATE:  
NAME: Alan Foley BEEPER: N/A  
PHONE: 617-423-7000 CEL PHONE: N/A
2. FIRE DEPARTMENT  
EMERGENCY: 911  
BUSINESS: (781) 316-3800  
  
POLICE DEPARTMENT  
EMERGENCY: 911  
BUSINESS: (781) 643-1212  
  
DEPARTMENT OF PUBLIC WORKS  
CONTACT: Michael Rademacher, Director  
BUSINESS: (781) 316-3104  
ALTERNATE: (781) 316-3301  
  
CONSERVATION COMMISSION  
CONTACT: Susan Chapnick, Chair  
BUSINESS: (781) 316-3090  
  
BOARD OF HEALTH  
CONTACT: Natasha Waden, Director  
BUSINESS: (781) 316-3170
3. MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION  
EMERGENCY: (888) 304-1133  
NORTHEAST REGION - WILMINGTON OFFICE: (978) 694-3200
4. NATIONAL RESPONSE CENTER  
PHONE: (800) 424-8802  
  
ALTERNATE: U.S. ENVIRONMENTAL PROTECTION AGENCY  
EMERGENCY: (617) 223-7265  
BUSINESS: (617) 860-4300





## Operation and Maintenance Manual

### **First® Defense**

### Vortex Separator for Stormwater Treatment

Stormwater Solutions  
Turning Water Around ...®

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<b>4</b>	<b>Maintenance</b> <ul style="list-style-type: none"><li>- Overview</li><li>- Determining Your Maintenance Schedule</li></ul>
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**DISCLAIMER:** Information and data contained in this manual is exclusively for the purpose of assisting in the operation and maintenance of Hydro International plc's First Defense®. No warranty is given nor can liability be accepted for use of this information for any other purpose. Hydro International plc has a policy of continuous product development and reserves the right to amend specifications without notice.

## First Defense® by Hydro International

Capturing more than 25 years of separation design experience, the First Defense® is Hydro International's latest addition to its family of hydrodynamic vortex separators intended for stormwater applications. It has been developed with ease of installation and maintenance at the forefront without sacrificing performance or design flexibility.

All internal components are housed in either a 4-ft or 6-ft diameter precast manhole that is designed to withstand traffic loads. Each model can be used as a catch basin inlet or standard manhole with solid cover so that runoff can enter from an overhead grate, inlet pipe or both without diminishing performance.

The First Defense® has internal components that are designed to generate rotational flow within the device without requiring a tangential inlet. Flow within the precast chamber is controlled to prevent turbulence and its unique reverse-flow outlet intake ensures a longer retention time by preventing short-circuiting. An internal bypass prevents high flow re-suspension and washout and eliminates the need for additional bypass structures. The internals can easily be adjusted to change the angle between the inlet and outlet for storm drain directional changes and dual inlets can be accommodated in most cases. This simplifies grading and site design so that flow can be conveyed from isolated locations within the same site without increasing the number of structures.

For removal of fine sediment and associated pollutants, oil spills, trash and debris, the first choice in stormwater treatment systems is the First Defense®.

### First Defense® Components

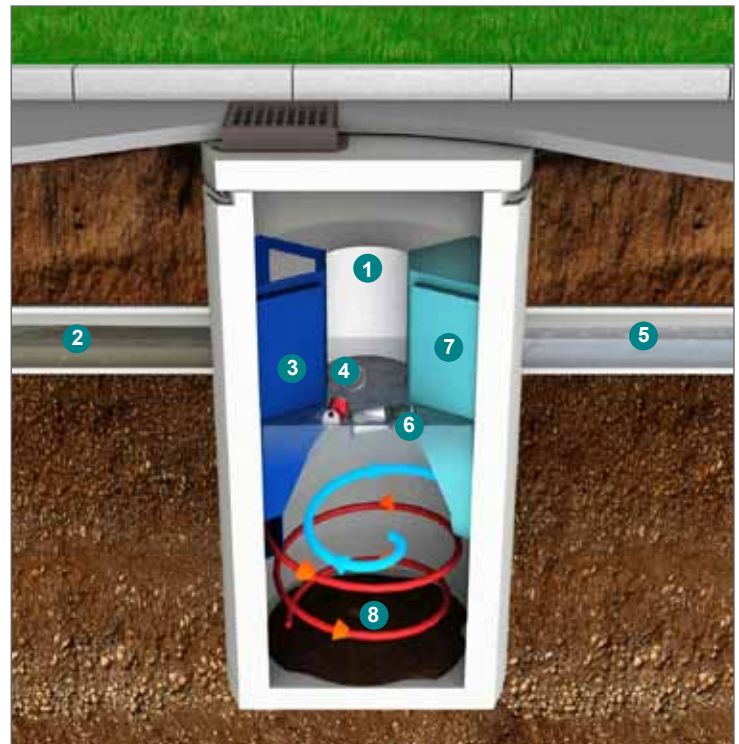
1. Built-In Bypass
2. Inlet Pipe
3. Inlet Chute
4. Floatables Draw-off Port (not pictured)
5. Outlet Pipe
6. Floatables Storage
7. Outlet Chute
8. Sediment Storage

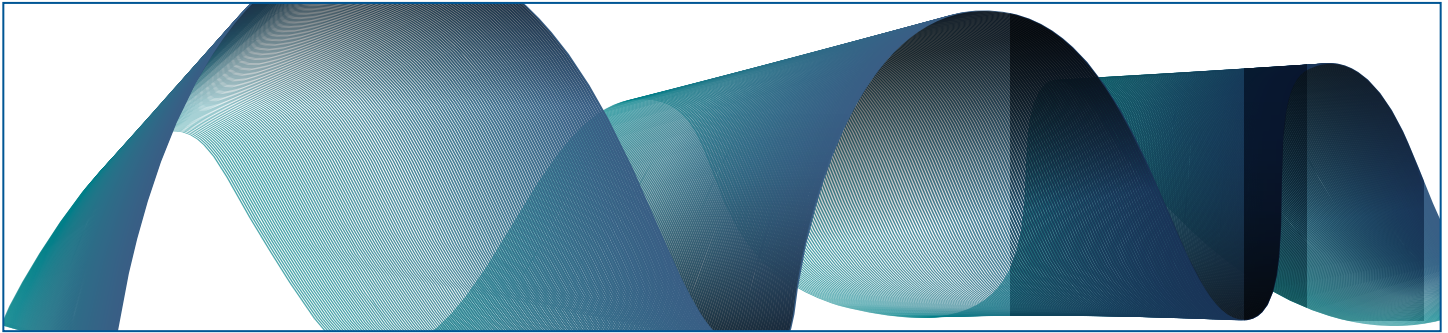
### Benefits of the First Defense®

- Compact and flexible design
  - Can be used as a catch basin inlet and directional change manhole
  - Optional one or two inlets
  - Does not require a bypass structure
- Hydrodynamic Vortex Separation
  - Extended and structured flow path
  - Minimal headloss
  - Reduces turbulence and re-suspension
  - Reverse-flow outlet intake prevents short-circuiting
  - Improved efficiency for all flows
- Delivered Pre-assembled for easy and fast installation
- Simple to inspect and maintain
- Independently verified

### Applications

- New developments and retrofits
- Utility yards
- Streets and roadways
- Parking lots
- Pre-treatment for filters, infiltration and storage
- Industrial and commercial facilities
- Wetlands protection





## Operation

### Introduction

The First Defense® operates on simple fluid hydraulics. It is self-activating, has no moving parts, no external power requirement and is fabricated with durable non-corrosive components. No manual procedures are required to operate the unit and maintenance is limited to monitoring accumulations of stored pollutants and periodic clean-outs. The First Defense® has been designed to allow for easy and safe access for inspection, monitoring and clean-out procedures. Neither entry into the unit nor removal of the internal components is necessary for maintenance, thus safety concerns related to confined-space-entry are avoided.

### Pollutant Capture and Retention

The internal components of the First Defense® have been designed to optimize pollutant capture. Sediment is captured and retained in the base of the unit, while oil and floatables are stored on the water surface in the inner volume. The pollutant storage volumes are isolated from the built-in bypass chamber to prevent washout during high-flow internally-bypassed storm events. Accessories such as oil absorbent pads are available for enhanced oil removal and storage. Due to the separation of the oil and floatable storage volume from the outlet, the potential for washout of stored pollutants between clean-outs is minimized.

### Wet Sump

The sump of the First Defense® retains a standing water level between storm events. The water in the sump prevents stored sediment from solidifying in the base of the unit. The clean-out procedure becomes more difficult and labor intensive if the system allows fine sediment to dry-out and consolidate. Dried sediment must be manually removed by maintenance crews. This is a labor intensive operation in a hazardous environment.

## Maintenance

### Overview

The First Defense® protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the First Defense®. The First Defense® will capture and retain sediment and oil until the sediment and oil storage volumes are full to capacity. When sediment and oil storage capacities are reached, the First Defense® will no longer be able to store removed sediment and oil. Maximum pollutant storage capacities are provided in Table 1.

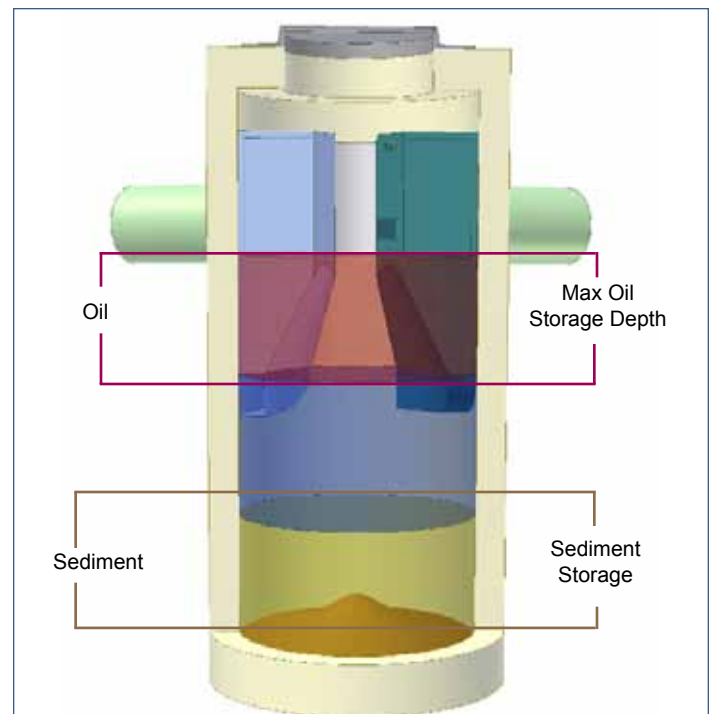


Fig.1 Pollutant storage volumes in the First Defense®.



The First Defense® allows for easy and safe inspection, monitoring and clean-out procedures. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables. Access ports are located in the top of the manhole.

Maintenance events may include Inspection, Oil & Floatables Removal, and Sediment Removal. Maintenance events do not require entry into the First Defense®, nor do they require the internal components of the First Defense® to be removed. In the case of inspection and floatables removal, a vactor truck is not required. However, a vactor truck is required if the maintenance event is to include oil removal and/or sediment removal.

### Determining Your Maintenance Schedule

The frequency of cleanout is determined in the field after installation. During the first year of operation, the unit should be inspected every six months to determine the rate of sediment and floatables accumulation. A simple probe such as a Sludge Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (see page 9) to establish a routine maintenance schedule.

The vactor procedure, including both sediment and oil/floatables removal, for a 6-ft First Defense® typically takes less than 30 minutes and removes a combined water/oil volume of about 800 gallons.

### Inspection

Inspection is a simple process that does not involve entry into the First Defense®. Maintenance crews should be familiar with the First Defense® and its components prior to inspection.

### Scheduling

- It is important to inspect your First Defense® every six months during the first year of operation to determine your site-specific rate of pollutant accumulation.
- Typically, inspection may be conducted during any season of the year.

### Recommended Equipment

- Safety Equipment and Personal Protective Equipment (traffic cones, work gloves, etc.)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net
- Sediment probe (such as a Sludge Judge®)
- Trash bag for removed floatables
- First Defense® Maintenance Log

Table 1. First Defense® Pollutant Storage Capacities and Maximum Cleanout Depths

Unit Diameter	Total Oil Storage	Oil Clean-out Depth	Total Sediment Storage	Sediment Clean-out Depth	Max. Liquid Volume Removed
(ft)	(gal)	(in)	(gal)	(in)	(gal)
4	180	<23.5	202	26	202-342
6	420	<23.5	626	36	626-1,046

#### NOTE

The total volume removed will depend on the oil accumulation level. Oil accumulation is typically much less than sediment, however removal of oil and sediment during the same service is recommended.

### Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities. Fig.2 shows the standing water level that should be observed.
4. Without entering the vessel, use the pole with the skimmer net to remove floatables and loose debris from the outer annulus of the chamber.
5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.
6. On the Maintenance Log (see page 9), record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.
7. Securely replace the grate or lid.
8. Take down safety equipment.
9. Notify Hydro International of any irregularities noted during inspection.

### Floatables and Sediment Cleanout

Floatables cleanout is typically done in conjunction with sediment removal. A commercially or municipally owned sump-vac is used to remove captured sediment and floatables (Fig.2).

Floatables and loose debris can also be netted with a skimmer and pole. The access port located at the top of the manhole provides unobstructed access for a vactor hose and skimmer pole to be lowered to the base of the sump.

### Scheduling

- Floatables and sump cleanout are typically conducted once a year during any season.
- Floatables and sump cleanout should occur as soon as possible following a spill in the contributing drainage area.

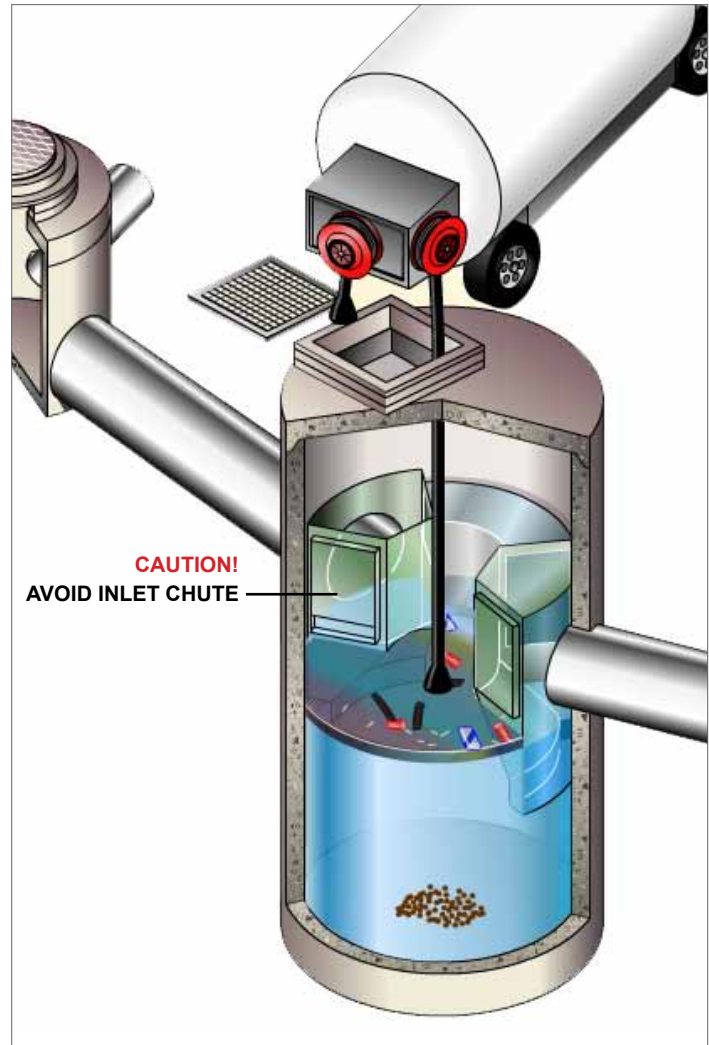


Fig.2 Floatables are removed with a vactor hose.

### Recommended Equipment

- Safety Equipment (traffic cones, etc)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (flexible hose recommended)
- First Defense® Maintenance Log

### Floatables and sediment Clean Out Procedures

1. Set up any necessary safety equipment around the access port or grate of the First Defense® as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the grate or lid to the manhole.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of any irregularities.
4. Remove oil and floatables stored on the surface of the water with the vactor hose (Fig.2) or with the skimmer or net (not pictured).
5. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel and record it in the Maintenance Log (page 9).
6. Once all floatables have been removed, drop the vactor hose to the base of the sump. Vactor out the sediment and gross debris off the sump floor (Fig.3).
7. Retract the vactor hose from the vessel.
8. On the Maintenance Log provided by Hydro International, record the date, unit location, estimated volume of floatables and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components, blockages, or irregularly high or low water levels.
9. Securely replace the grate or lid.

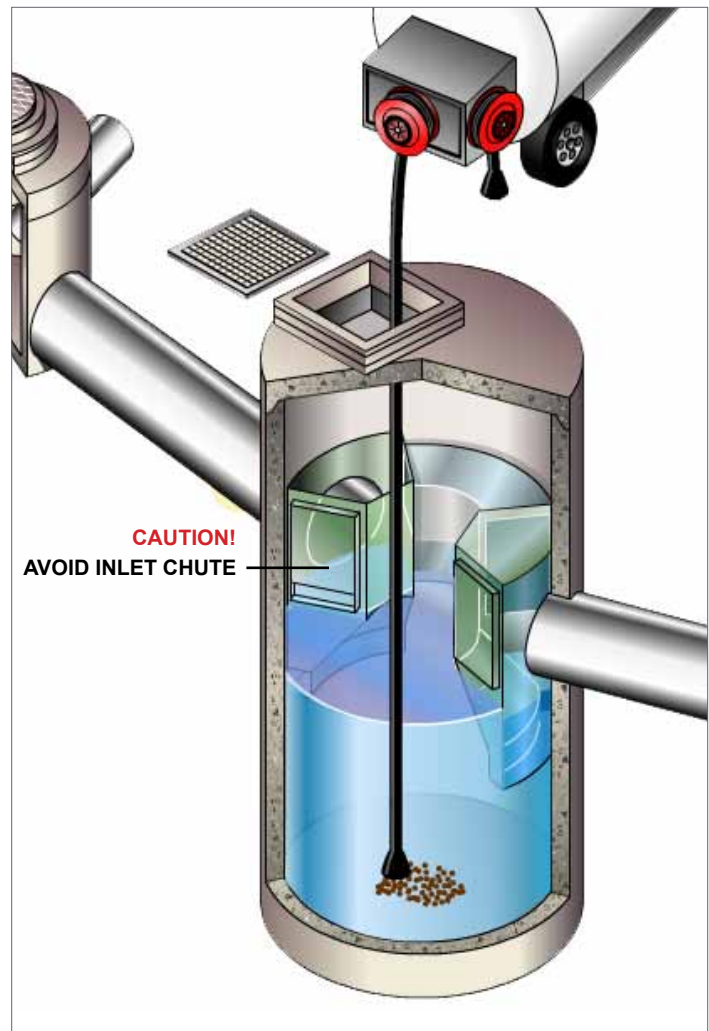


Fig.3 Sediment is removed with a vactor hose

## Maintenance at a Glance

Activity	Frequency
Inspection	<ul style="list-style-type: none"> <li>- Regularly during first year of installation</li> <li>- Every 6 months after the first year of installation</li> </ul>
Oil and Floatables Removal	<ul style="list-style-type: none"> <li>- Once per year, with sediment removal</li> <li>- Following a spill in the drainage area</li> </ul>
Sediment Removal	<ul style="list-style-type: none"> <li>- Once per year or as needed</li> <li>- Following a spill in the drainage area</li> </ul>

NOTE: For most cleanouts it is not necessary to remove the entire volume of liquid in the vessel. Only removing the first few inches of oils/floatables and the sediment storage volume is required.

## First Defense® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE:     /     /

MODEL SIZE (CIRCLE ONE):     4-FT

6-FT

INLET (CIRCLE ALL THAT APPLY):     GRATE INLET (CATCH BASIN)

INLET PIPE (FLOW THROUGH)











## What is HX?

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HX is Hydro Experience, it is the essence of Hydro. It's interwoven into every strand of Hydro's story, from our products to our people, our engineering pedigree to our approach to business and problem-solving.

HX is a stamp of quality and a mark of our commitment to optimum process performance. A Hydro solution is tried, tested and proven.

There is no equivalent to Hydro HX.

## Stormwater Solutions

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Portland, ME 04102

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## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control

Division of Water Quality

401-02B

Post Office Box 420

Trenton, New Jersey 08625-0420

609-633-7021 Fax: 609-777-0432

[http://www.state.nj.us/dep/dwq/bnpc\\_home.htm](http://www.state.nj.us/dep/dwq/bnpc_home.htm)

CHRIS CHRISTIE

*Governor*

KIM GUADAGNO

*Lt. Governor*

BOB MARTIN

*Commissioner*

April 4, 2016

Lisa Lemont, CPSWQ  
Business Development Manager  
Hydro International  
94 Hutchins Drive  
Portland, ME 04102

Re: MTD Lab Certification  
First Defense® HC (FDHC) Stormwater Treatment Device by Hydro International

### **TSS Removal Rate 50%**

Dear Ms. Lemont:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Hydro International has requested an MTD Laboratory Certification for the First Defense® HC Stormwater Treatment Device.

The projects falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated February 2016) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

**The NJDEP certifies the use of the First Defense® HC Stormwater Treatment Device by Hydro International at a TSS removal rate of 50% when designed, operated and maintained in accordance with the information provided in the Verification Appendix and the following conditions:**

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The First Defense® HC Stormwater Treatment Device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.
3. This First Defense® HC Stormwater Treatment Device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at [www.njstormwater.org](http://www.njstormwater.org).
5. The maintenance plan for a site using the First Defense® HC Stormwater Treatment Device shall incorporate, at a minimum, the maintenance requirements noted in the attached document. However, it is recommended to review the maintenance website at [http://www.hydro-int.com/UserFiles/downloads/FD\\_O%2BM\\_F1512.pdf](http://www.hydro-int.com/UserFiles/downloads/FD_O%2BM_F1512.pdf) for any changes to the maintenance requirements.
6. Sizing Requirements:

The example below demonstrates the sizing procedure for the First Defense® HC Stormwater Treatment Device:

Example: A 0.25 acre impervious site is to be treated to 50% TSS removal using a First Defense® HC Stormwater Treatment Device. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

time of concentration = 10 minutes

i=3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)

c=0.99 (curve number for impervious)

$Q=ciA=0.99 \times 3.2 \times 0.25=0.79$  cfs

Given the site runoff is 0.79 cfs and based on Table 1 below, the First Defense® HC Model 4-ft with a MTFR of 1.5 cfs would be the smallest model approved that could be used for this site that could remove 50% of the TSS from the impervious area without exceeding the MTFR.

The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1 and Table A-2 of the NJCAT Verification Report.

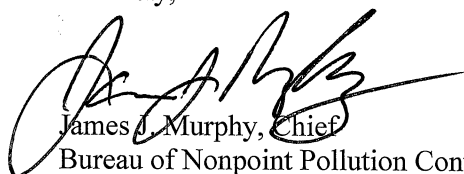
Table 1 First Defense® HC Models

First Defense® Model	Manhole Diameter (ft)	Maximum Treatment Flowrate, MTFR (cfs)
4-ft	4-ft	1.50
6-ft	6-ft	3.38
8-ft	8-ft	6.00

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual.

If you have any questions regarding the above information, please contact Mr. Titus Magnanao of my office at (609) 633-7021.

Sincerely,

  
James J. Murphy, Chief  
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

C: Chron File  
Richard Magee, NJCAT  
Vince Mazzei, DLUR  
Ravi Patraju, NJDEP  
Gabriel Mahon, BNPC  
Titus Magnanao, BNPC

# **NJCAT TECHNOLOGY VERIFICATION**

**First Defense<sup>®</sup> HC Stormwater Treatment Device**

**Hydro International**

**February, 2016**

**(Revised Table A-2 January 2017)**



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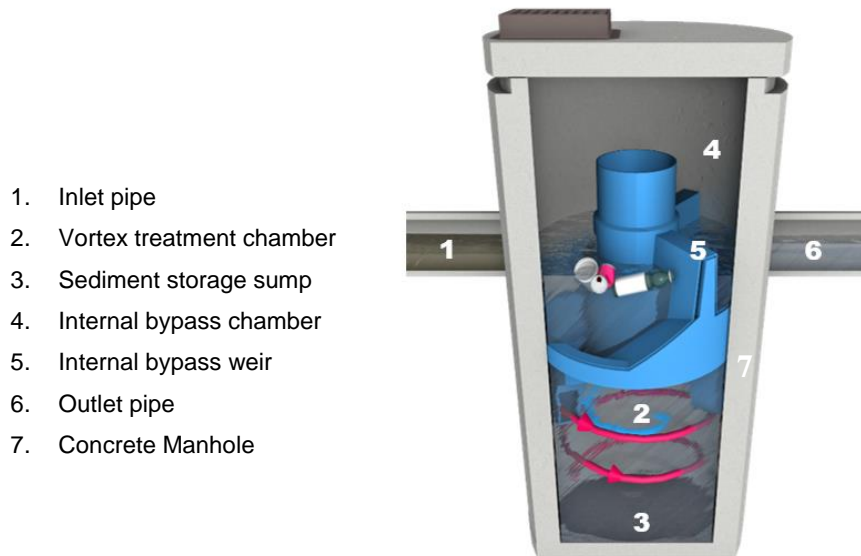
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## 1. Description of Technology

The First Defense® HC (FDHC) is a vortex separator designed and supplied by Hydro International. The FDHC is installed as part of typical drainage network systems to capture particulate pollutants that have entered the system from surface runoff. The FDHC has patented flow-modifying internal components that create a swirling flow path within the treatment chamber, which serves to supplement gravitational settling forces with additional vortex forces for enhanced settling performance. The FDHC chamber is a precast concrete manhole. The internal components are rotationally molded high density polyethylene. The internal components include an internal bypass weir to divert peak flows over the treatment chamber to prevent captured particles from being resuspended and washed out (**Figure 1**).



**Figure 1 First Defense HC**

Stormwater enters the FDHC through an inlet pipe and/or a surface grate. Hydrocarbons and other floatable solids rise to the surface where they are captured on the inlet side of the internal bypass weir. Stormwater is conveyed through a submerged inlet chute designed to initiate a spiraling flow path within the vortex treatment chamber. Suspended solids are captured in the sediment storage sump. Treated water exits the vortex treatment chamber via an outlet chute and exits the FDHC via an outlet pipe.

As many development sites in New Jersey require more than 50% TSS removal, the FDHC can be used as a pretreatment component in a treatment train when higher TSS removals are required and polishing BMPs such as infiltration or bio-infiltration are designed downstream.

## 2. Laboratory Testing

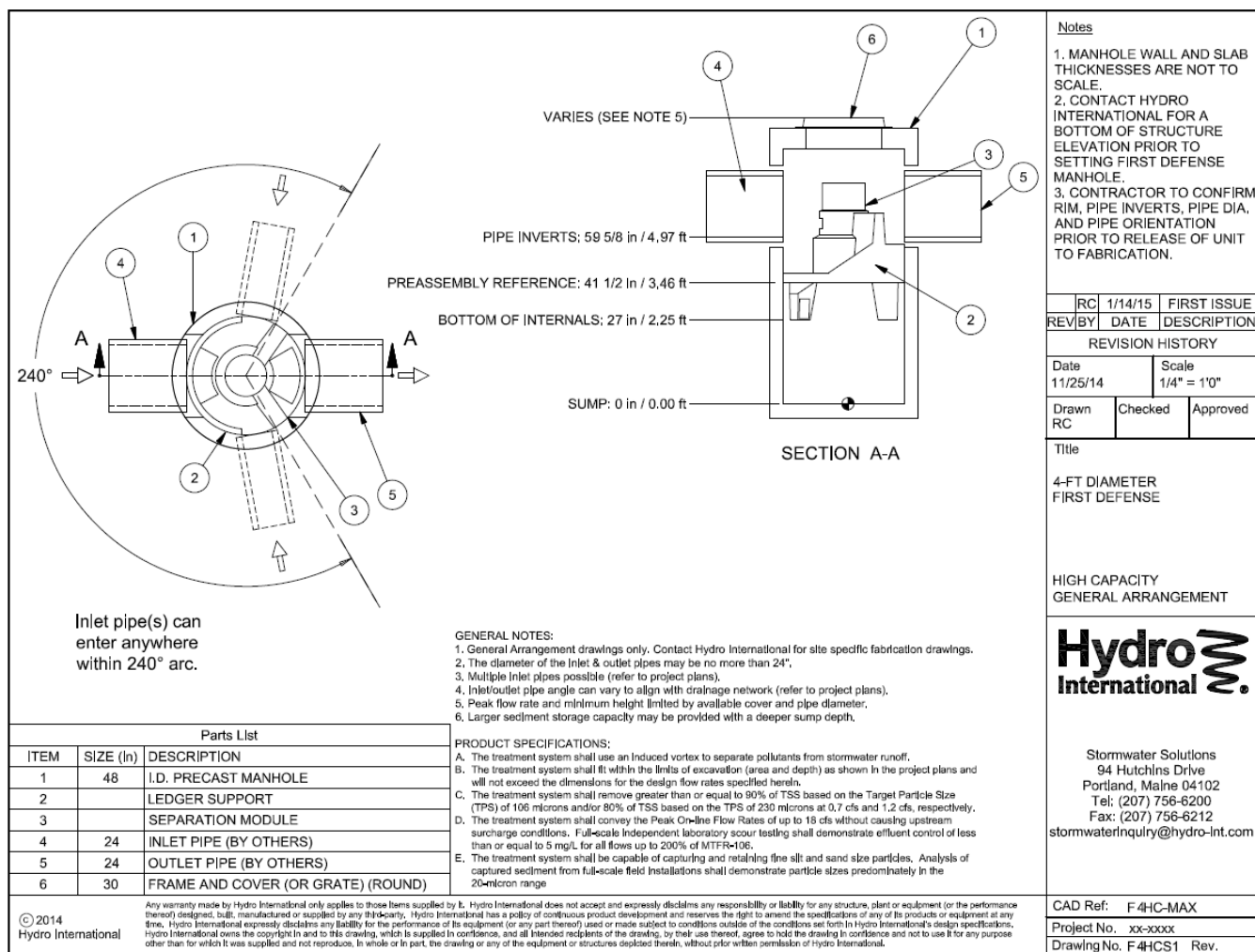
This testing was conducted to independently verify the FDHC such that it could be certified by the New Jersey Department of Environmental Protection (NJDEP) as a 50% Total Suspended Solids removal device.

The FDHC was tested to the “New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device” (NJDEP 2013). The testing was conducted in Portland, Maine at Hydro International’s hydraulics laboratory under the supervision of FB Environmental Associates, Inc., who served as the independent observer. FB Environmental is a Portland, Maine based environmental engineering consultancy with prior experience serving as the independent observer for several hydrodynamic separators previously tested to this protocol.

The particle size distribution of the removal efficiency test sediment samples were analyzed by the independent analytical laboratory GeoTesting Express in Acton, Massachusetts. The particle size distribution samples for the scour testing test sediment were analyzed at the Hydro International laboratory under the supervision of the independent observer. All water quality samples for both the removal efficiency testing and the washout testing were collected, labeled and sealed under the direct supervision of the independent observer from FB Environmental and analyzed by Maine Environmental Laboratory in Yarmouth, Maine.

### 2.1 Test Unit

The test unit was a 4-ft FDHC comprised of full scale, commercially available 4-ft FDHC internal components installed in a 4-ft round plastic manhole chamber consistent in all key dimensions with the precast chambers used for commercial sales (**Figure 2**). Both the inlet and outlet pipe diameters of the test model were 24 inches, which is the standard pipe size for a 4-ft FDHC.

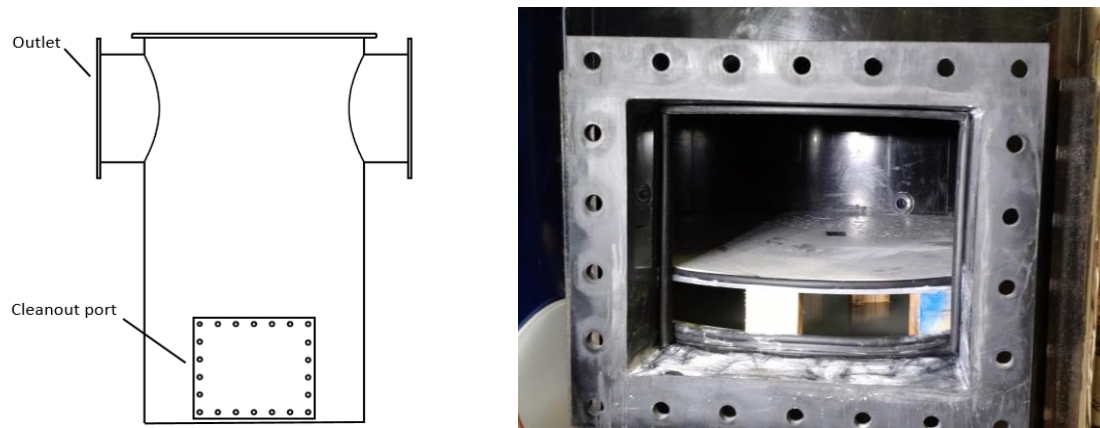


**Figure 2 4-ft FDHC**

The test vessel, unlike a commercial FDHC, had a rectangular access port located on the sump wall (**Figure 3a-b**). The access port eliminated the need for complete removal of the internal components and confined space entry into the FDHC to clean the unit between test events.

To ensure dimensional consistency with a commercial unit, the inside of the sump access port was fitted with an insert fabricated to be flush with the interior of the cylindrical manhole wall (**Figure 4**). Therefore the access port did not provide any additional sump storage capacity, did not alter the flow path within the vortex treatment chamber and ensured that the test vessel was dimensionally consistent to a standard commercial FDHC.

Prior to the beginning of the testing program, Hydro International laboratory technicians measured and recorded the key dimensions of the test vessel in the presence of the independent observer to ensure that the test unit assembly and test vessel dimensions were consistent with a commercial 4-ft FDHC.



**Figure 3 Schematic Drawing and Photo of Sump Access Port**



**Figure 4 Sump Access Port sits Flush with Interior Manhole Wall**

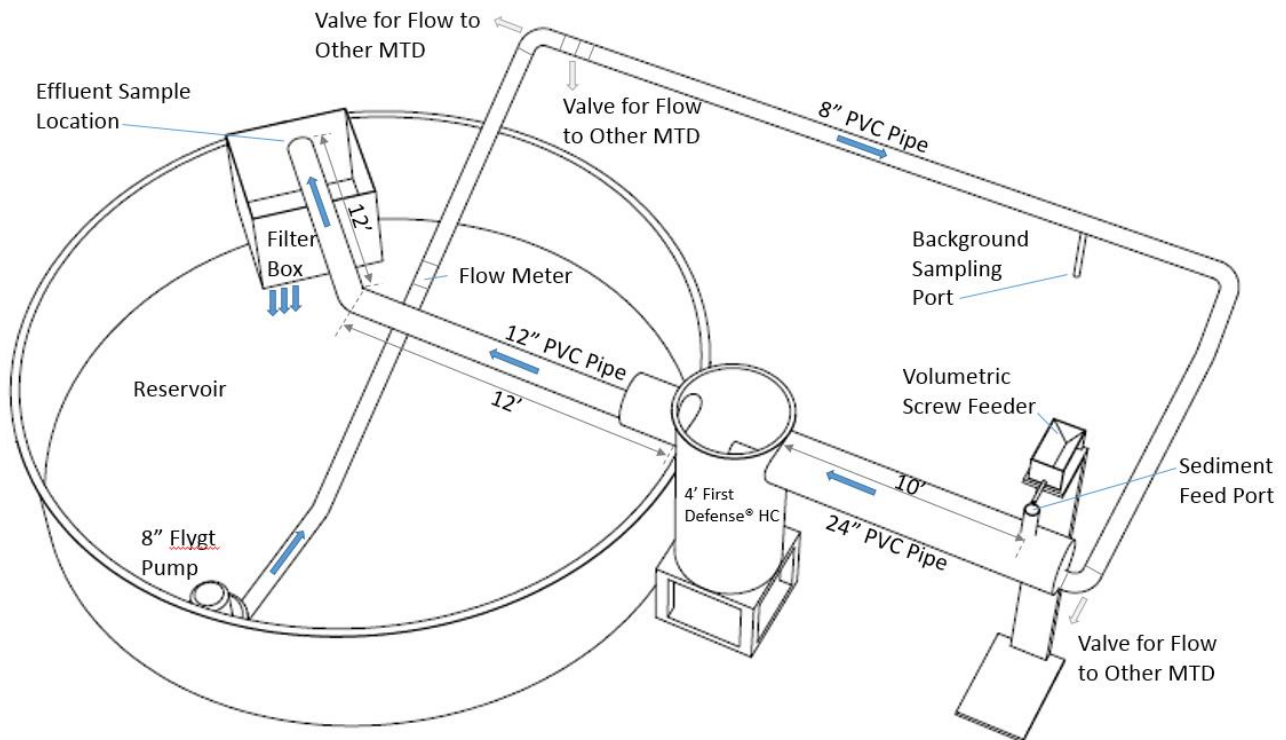
## 2.2 Test Setup

The laboratory setup consisted of a recirculating closed loop system with an 8-inch submersible Flygt pump that conveyed water from a 23,000 gallon reservoir through a PVC pipe network to the 4-ft FDHC (**Figure 5**). The flow rate of the pump was controlled by a GE Fuji Electric AF-300 P11 Adjustable Frequency Drive and measured by an EMCO Flow Systems 4411e Electromagnetic Flow Transmitter.

The water temperature within the reservoir was regulated by a Hayward 350FD pool heater, which was used to reduce the possibility of volatility in the test data that could potentially be caused by variability in water temperatures between test runs. The night before a test run, the heater was set to 80°F. In the morning, the heater was turned off at least one hour before testing began. The heater then remained off throughout the entire duration of each test run. The Hayward 350FD assembly includes a small recirculation pump that causes a gentle current in the reservoir, which could potentially cause high background concentration readings during testing by carrying sediment discharged during a test run back to the main reservoir feed pump more



quickly. Turning the heater off allowed any water movement in the reservoir to stop before the beginning of testing. The test reservoir temperature was recorded at 30 second intervals by a Lascar thermometer and temperature logger over the duration of each test.



**Figure 5 Laboratory Testing Arrangement**

Three flow isolation valves were located between the Flygt pump and the FDHC, which would allow flow to bypass the FDHC if fully opened. These valves were installed as part of the piping network to direct flow to three other manufactured stormwater and wastewater treatment systems installed at the test facility along the same piping network, and were fully closed throughout the entire period when the FDHC testing was conducted.

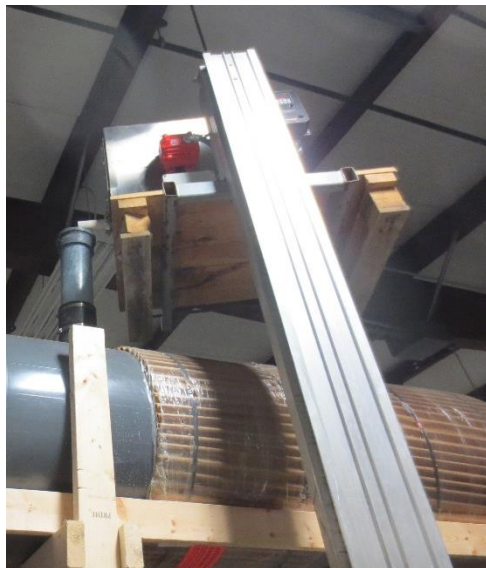
A background sampling port was installed about 27 feet upstream of the FDHC. The FDHC effluent discharged freely from the effluent pipework, where grab samples were taken. The free discharge flowed through a filter box fitted with 1 micron filter socks in order to remove the majority of fine sediment that remained in the flow stream (**Figure 6**). The filter box was located on the opposite side of the reservoir as the submersible pump in order to keep the background concentration from surpassing the maximum allowable limit over the duration of the removal efficiency tests.



**Figure 6 Effluent Sampling Location Situated above the Filter Box**

*Total Suspended Solids Removal Efficiency Laboratory Test Setup*

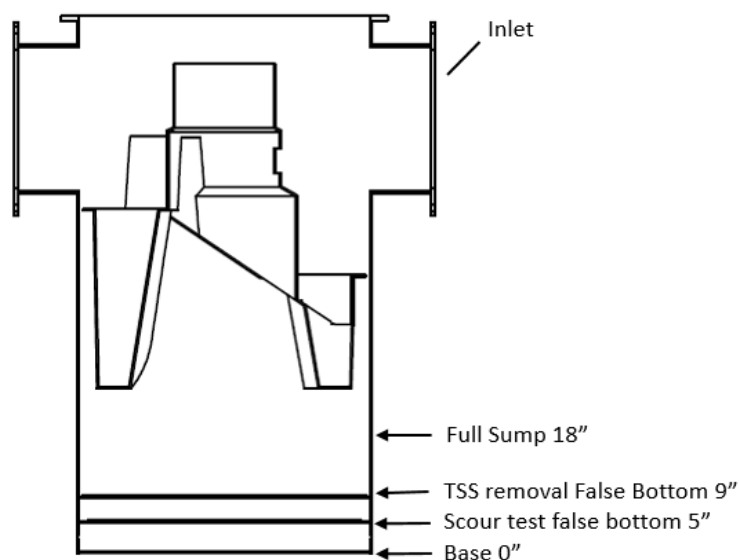
For the removal efficiency test runs, test sediment was introduced into the flow at a consistent, calibrated rate by an Auger Feeder Model VF-2 volumetric screw feeder situated atop a 4-inch port in the 2 foot diameter inlet pipe located 10 feet upstream of the FDHC test unit. The location of the port is shown in **Figure 7**.



**Figure 7 Influent Feed Port for TSS Removal Efficiency Testing**

The FDHC sump measures 18 inches in height from the bottom of the sump. In line with the

protocol requirements, it was fitted with a false bottom positioned 9 inches from the true sump bottom to simulate a 50% full condition (**Figure 8**). It was secured to the chamber and sealed around the edges to prevent any material from collecting below.



**Figure 8 False Bottom Positions used during FDHC Testing**

### *Scour Test Laboratory Setup*

To simulate the 50% full condition for the scour test, the false bottom was set 5 inches above the sump floor (**Figure 8**) and 4 inches of the scour test sediment blend was pre-loaded on top of the false bottom, bringing the level of sump contents to 9 inches from the sump bottom.

## **2.3 Test Sediment**

### *Test Sediment Feed for Suspended Solids Removal Efficiency Testing*

The test sediment used for the Suspended Solids Removal Efficiency Testing was an in-house blend of high purity silica ( $\text{SiO}_2$  99.8%) supplied by AGSCO Corporation and U.S. Silica, Inc., both commercial silica suppliers. Prior to the start of the removal efficiency testing, a total of five batches of test sediment were blended by Hydro International. Three sediment samples and one spare sample approximately 400 mL in volume were composited from 80 mL subsamples collected from each of the 5 batches under the supervision of the independent observer. The 4 samples were sealed, signed and packaged for independent transport to the outside laboratory under the supervision of the independent observer. After the samples were taken, the 5 batches were sealed and set aside until use. The independent laboratory, GeoTesting Express, analyzed the particle size distribution of each of the 3 samples and the spare sample using ASTM D 422-63. The particle size distributions of each of the 3 samples were averaged and reported as the overall particle size distribution. The particle size distribution of the spare sample was found to meet the protocol specification, however it was not included in the reported average particle size

distribution (PSD) because the protocol specifically states that three samples shall be analyzed and averaged.

### *Scour Test Sediment*

The test sediment used for the Scour Testing was high purity (99.8% SiO<sub>2</sub>) silica blended by AGSCO Corporation, an independent commercial silica supplier, to meet the specified particle size distribution of the protocol. The scour test sediment was delivered to Hydro International prepackaged, in sealed 50-lb bags. Under observation of the independent observer, three 250 mL subsamples were taken from randomly selected areas of the sump. The subsamples were then sealed and signed under observation of the independent observer and analyzed at the Hydro International laboratory for PSD analysis under the observation of the independent observer at a later date. The reported PSD is the average of the three subsample particle size distributions.

## **2.4 Removal Efficiency Testing Procedure**

Removal efficiency testing was conducted in accordance with Section 5 of the NJDEP Laboratory Protocol for HDS MTDs. A total of five flow rates were tested: the 25%, 50%, 75%, 100% and 125% Maximum Treatment Flow Rate (MTFR). FB Environmental acted as the independent observer for the duration of all testing and water quality sample collection, sealing and packaging for transportation to the independent laboratory. Captured sediment was removed from the sump between each flow rate trial.

The test sediment mass was fed into the flow stream at a known rate using a screw auger with a calibrated funnel. Sediment was introduced at a rate within 10% of the targeted value of 200 mg/L influent concentration throughout the duration of the testing.

Six calibration samples were taken from the injection point. The calibration samples were timed at evenly spaced intervals over the total duration of the test for each tested flow rate and timed such that no collection interval would exceed 1 minute in duration. Each calibration sample was a minimum of 100 mL collected in a clean 1-liter container over an interval timed to the nearest second. These samples were weighed to the nearest milligram. The average influent TSS concentration was calculated using the total mass of the test sediment added during dosing divided by the volume of water that flowed through the MTD during dosing (**Equation 1**). The mass extracted for calibration samples was subtracted from the total mass introduced to the system when removal efficiency was subsequently calculated. The volume of water that flows through the MTD was calculated by multiplying the average flow rate by the time of sediment injection only.

$$\text{Average Influent Concentration} = \frac{\text{Total mass added}}{\text{Total volume of water flowing through the MTD during addition of test sediment}}$$

### **Equation 1 Calculation for Average Influent Concentration**



During each flow rate test, the flow meter data logger recorded flow rate at a minimum of once per minute. The Effluent Grab Sampling Method was used as per Section 5D of the protocol. Once a constant rate of flow and test sediment feed were established, a minimum of three MTD detention times passed before the first effluent sample was collected. All effluent samples were collected in clean half-liter bottles using a sweeping grab sampling motion through the effluent discharge as described in Section 5D of the protocol. Samples were then time stamped and placed into a box for transportation to the analytical laboratory.

The time interval between sequential samples was evenly spaced during the test sediment feed period to obtain 15 samples for each flow rate. The water temperature was recorded at 30 second intervals to ensure that it did not exceed 80 degrees Fahrenheit at any time.

Background samples were taken at the background sample port located upstream of the FDHC test setup. Influent background samples were taken at the same time as odd numbered effluent grab samples (first, third, fifth, etc.). The collection time for each background and effluent sample was recorded. Each collected sample was time stamped, sealed and signed by the independent observer.

At the conclusion of the test all of the collected effluent and background water quality samples were placed into a delivery box, the box was sealed and the seal was signed by the independent observer. All samples were analyzed by Maine Environmental Laboratory in accordance with ASTM D3977-97 (re-approval 2007) “Standard Test Methods for Determining Sediment Concentrations in Water Samples”.

The background data were plotted on a curve for use in adjusting the effluent samples for background concentration. The FDHC removal efficiency for each tested flow rate was calculated as per **Equation 2**.

$$\text{Removal Efficiency (\%)} = \frac{\left( \text{Average Influent Concentration} - \frac{\text{Adjusted Average Effluent* Concentration}}{\text{Average Influent Concentration}} \right)}{\text{Average Influent Concentration}} \times 100$$

\* Adjusted for background concentration

### **Equation 2 Equation for Calculating Removal Efficiency**

## **2.5 Scour Testing Procedure**

To simulate a 50% full sump condition, the FDHC sump false bottom was set to a height of 5 inches and then topped with 4 inches of scour test sediment. The sediment was leveled, then the FDHC was filled with clear water at a slow rate as to not disturb the sediment prior to the beginning of testing. In line with the protocol, scour testing was begun less than 96 hours after the sump was pre-loaded with test sediment. All setup measurements, testing and sample collection procedures were observed by the independent observer.

Scour testing began by slowly introducing flow and, in less than 5 minutes, ramping up the flow rate until it reached >200% of the MTFR. The flow rate was recorded at a minimum of once per minute so that the effluent samples could be compared to corresponding flow rates. The flow rate remained constant at the target maximum flow rate for the remainder of the test duration.

Effluent samples were collected and time stamped every 2 minutes after the target flow rate was reached. A minimum of 15 effluent samples were taken over the duration of the test. The effluent samples were collected in half liter bottles using the grab sampling method as described in Section 5D of the protocol. Temperature readings of the test water were recorded every 30 seconds to ensure it did not exceed 80 degrees Fahrenheit at any point during the test.

Eight background samples were collected at evenly spaced intervals throughout the duration of the target maximum flow rate testing. The background samples were drawn from the background sample port located upstream of the FDHC.

At the conclusion of the test all of the collected effluent and background water quality samples were placed into a delivery box, the box was sealed and the seal was signed by the independent observer. All samples were analyzed by Maine Environmental Laboratory in accordance with ASTM D3977-97 (re-approval 2007) “Standard Test Methods for Determining Sediment Concentrations in Water Samples”.

### **3. Performance Claims**

In line with the NJDEP verification procedure, FDHC performance claims are outlined below.

#### *Total Suspended Solids Removal Rate*

The TSS removal rate of the FDHC is dependent upon flow rate, particle density and particle size. For the particle size distribution and weighted calculation method required by the NJDEP HDS MTD protocol, the 4-ft FDHC at a MTFR of 1.50 cfs will demonstrate at least 50% TSS removal efficiency.

#### *Maximum Treatment Flow Rate*

The MTFR for the 4-ft FDHC was demonstrated to be 673 gpm (1.50 cfs), which corresponds to a surface loading rate of 53.6 gpm/sf.

#### *Sediment Storage Depth and Volume*

The maximum sediment storage depth of the FDHC is 18 inches. Available sediment storage volume varies with each FDHC model, as FDHC model dimensions increase in diameter. The available sump volume for a 4-ft FDHC model is 0.70 cubic yards. The maximum sediment storage depth is 9 inches, which corresponds to a 50% full sump capacity (or 0.35 cubic yards) for the standard model. Refer to **Table A-2** in the Verification Appendix for the 50% sump full capacities for other FDHC model sizes.

### *Effective Treatment Area and Effective Sedimentation Area*

The effective treatment and sedimentation area of the FDHC model varies with model size, as it corresponds to the surface area of the FDHC model diameter. The tested 4-ft FDHC model has a treatment surface area of 12.56 square feet.

### *Detention Time and Volume*

The detention time of the FDHC depends on flow rate and model size. The detention time is calculated by dividing the treatment volume by the flow rate. The treatment volume is defined as the volume between the pipe invert and the top of the sediment storage zone. For the tested 4-ft FDHC model at the MTR of 1.50 cfs, the detention time is 29 seconds.

### *Online or Offline Installation*

Based on the results of the Scour Testing shown in Section 4.4, the FDHC qualifies for online installation.

## **4. Supporting Documentation**

The NJDEP Procedure (NJDEP, 2013a) for obtaining verification of a stormwater manufactured treatment device (MTD) from the New Jersey Corporation for Advanced Technology (NJCAT) requires that “copies of the laboratory test reports, including all collected and measured data; all data from performance evaluation test runs; spreadsheets containing original data from all performance test runs; all pertinent calculations; etc.” be included in this section. This was discussed with NJDEP and it was agreed that as long as such documentation could be made available by NJCAT upon request that it would not be prudent or necessary to include all this information in this verification report.

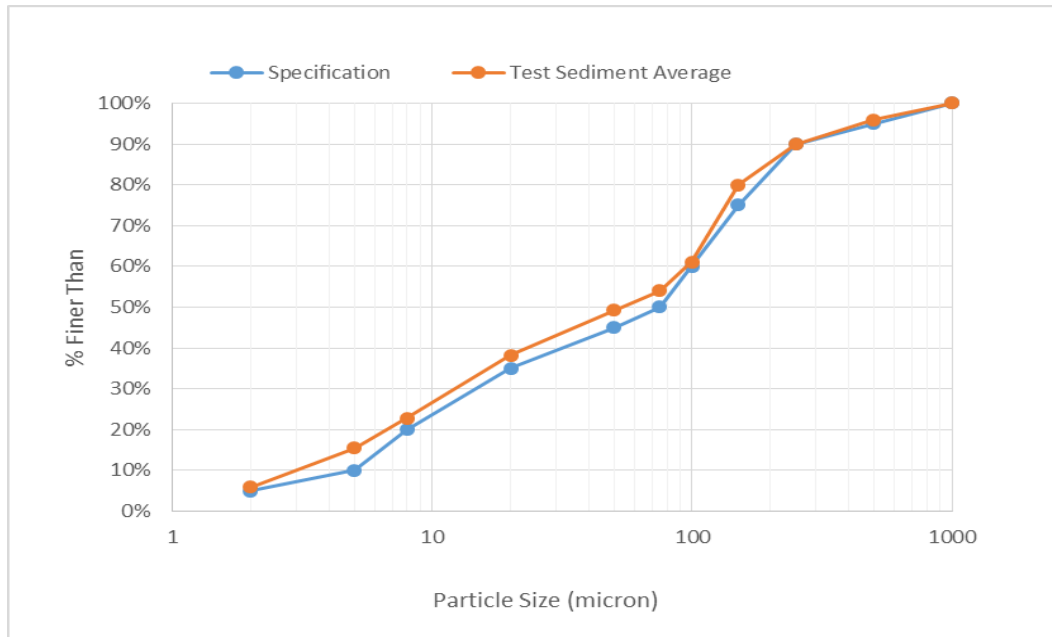
### **4.1 Test Sediment PSD Analysis – Removal Efficiency Testing**

Hydro International purchased two different grades of high purity silica ( $\text{SiO}_2$  99.8%) supplied by two different commercial silica suppliers. These silica blends were mixed together at the proportions required to generate a test sediment that complied with the particle size distribution requirements specified in the NJDEP HDS MTD protocol.

Prior to the start of removal efficiency testing trials conducted in November 2015, 5 batches of test sediment were blended by Hydro International. Three composite sediment samples and one spare sample approximately 400 mL in volume were blended using 80 mL of sediment collected from 6 subsamples drawn from each of the 5 batches under the supervision of the independent observer. The samples were also sealed and packaged for independent transport to the outside laboratory under the supervision of the independent observer. The independent laboratory GeoTesting Express analyzed the particle size distribution of each sample using ASTM D 422-63. The test sediment was found to be slightly finer than the protocol specified sediment blend. The results and the comparison to the protocol specification are shown in **Table 1** and **Figure 9**.

**Table 1 - Particle Size Distribution Results of Test Sediment Samples**

Particle Size	% Finer					Difference from Protocol %
µm	Protocol	Sample 1	Sample 2	Sample 3	Test Sediment Average	
1000	100	100.0	100.0	100.0	100.0	0.0
500	95	96.0	96.0	96.0	96.0	-1.0
250	90	90.0	90.0	90.0	90.0	0.0
150	75	80.0	80.0	80.0	80.0	-5.0
100	60	61.1	61.9	60.4	61.1	-1.1
75	50	54.0	54.0	54.0	54.0	-4.0
50	45	49.5	49.1	49.4	49.3	-4.3
20	35	39.1	37.8	37.9	38.3	-3.3
8	20	23.2	22.8	22.2	22.7	-2.7
5	10	15.3	15.9	15.1	15.4	-5.4
2	5	5.5	6.5	5.5	5.8	-0.8



**Figure 9 Average Test Sediment PSD vs Protocol Specification**



## 4.2 Removal Efficiency Testing

In accordance with the NJDEP HDS Protocol, removal efficiency testing was executed on the First Defense<sup>®</sup> HC 4-ft. unit in order to establish the ability of the FDHC to remove the specified test sediment at 25%, 50%, 75%, 100% and 125% of the target MTFR. The target MTFR was 673 gpm (1.50 cfs). This target was chosen based on the ultimate goal of demonstrating greater than 50% annualized weighted solids removal as defined in the Protocol.

All results reported in this section were derived from test runs that fully complied with the terms of the protocol. None of the collection intervals of the calibration samples exceeded one minute in duration for any of the reported tests. The inlet feed concentration coefficient of variance (COV) did not exceed 0.10 for any flow rate trials.

The mean influent concentration was calculated using Equation 1 from *Section 2.4 Removal Efficiency Test Procedure*. The mean effluent concentration was adjusted by subtracting the measured background concentrations. No background TSS concentrations exceeded the 20 mg/L maximum allowed by the protocol. At no point did the water temperature exceed 80 °F.

### *25% MTFR Results*

The 25% MTFR test was conducted in accordance with the NJDEP HDS Protocol at a target flow rate of 0.38 cfs. A summary of test readings, measurements and calculations are shown in **Table 2**. Feed calibration results are shown in **Table 3**. Background and effluent sampling measurements are shown in **Table 4**.

The 4-ft FDHC removed 61.1% of the test sediment at a flow rate of 0.38 cfs. **Table 5** shows that the QA/QC results for flow rate, feed rate and influent and effluent background concentrations were within the allowable parameters specified by the protocol.

**Table 2 - Summary of 4-ft FDHC 25% MTFR Test**

<b>Trial Date</b>	<b>Target Flow (cfs)/(gpm)</b>	<b>Detention Time (sec)</b>	<b>Target Sediment Concentration (mg/L)</b>	<b>Target Feed Rate (mg/min)</b>	<b>Test Duration (Min)</b>
11/02/2015	0.38 /168.4	116	200	130,995	44:36
<b>Measured Values</b>					
<b>Mean Flow Rate (cfs)/(gpm)</b>	<b>Mean Influent Concentration<sup>1</sup> (mg/L)</b>	<b>Max. Water Temperature °C / °F</b>	<b>Mean Adjusted Effluent Concentration (mg/L)</b>	<b>Average Removal Efficiency</b>	<b>QA/QC Compliance</b>
0.38 /169.0	205.0	25.5 / 77.9	79.7	61.1%	YES

<sup>1</sup> The mean influent concentration reported is calculated by dividing the entire mass of test sediment injected into the flow stream over the duration of the test divided by the total flow during the injection of test sediment.

**Table 3 - 4-ft FDHC 25% MTFR Test Calibration Results**

<b>Target Concentration</b>	<b>200 mg/L</b>	<b>Target Feed Rate</b>		<b>130,995 mg/min</b>	
<b>Sample ID</b>	<b>Sample Time (min)</b>	<b>Sample Mass (g)</b>	<b>Sample Duration (sec)</b>	<b>Feed Rate (mg/min)</b>	<b>Calculated Influent Concentration (mg/L)</b>
<b>Feed Rate 1</b>	0:00	136.255	60	136,255	213
<b>Feed Rate 2</b>	8:42	128.774	60	128,774	201
<b>Feed Rate 3</b>	17:24	129.323	60	129,323	202
<b>Feed Rate 4</b>	26:06	130.640	60	130,640	204
<b>Feed Rate 5</b>	34:48	129.336	60	129,336	202
<b>Feed Rate 6</b>	43:29	135.498	60	135,498	212
			<b>Mean</b>	131,638	<b>206</b>

**Table 4 – 4-ft FDHC 25% MTR Background and Effluent Measurements**

Sample ID	Time (min)	Concentration (mg/L)		
Background 1	7:42	2		
Background 2	8:42	2		
Background 3	16:54	2		
Background 4	25:06	6		
Background 5	26:06	7		
Background 6	34:18	8		
Background 7	42:29	12		
Background 8	43:29	12		
Sample ID	Time (min)	Concentration (mg/L)	Associated Background Concentration (mg/L)	Adjusted Concentration (mg/L)
Effluent 1	7:42	81	2	79
Effluent 2	8:12	81	2	79
Effluent 3	8:42	79	2	77
Effluent 4	16:24	80	2	78
Effluent 5	16:54	77	2	75
Effluent 6	17:24	80	4	76
Effluent 7	25:06	83	6	77
Effluent 8	25:36	83	6.5	77
Effluent 9	26:06	86	7	79
Effluent 10	33:48	90	7.5	83
Effluent 11	34:18	90	8	82
Effluent 12	34:48	89	10	79
Effluent 13	42:29	92	12	80
Effluent 14	42:59	98	12	86
Effluent 15	43:29	102	12	90
	<b>Mean</b>	<b>86.1</b>	<b>6.3</b>	<b>79.7</b>

**Table 5 – 4-ft FDHC 25% MTFR Trial QA/QC Results**

<b>Flow Rate</b>			
Target (cfs / gpm)	Mean (cfs / gpm)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
0.38 / 168.4	0.38 / 169.0	0.019	<0.03
<b>Feed Rate</b>			
Target (mg/min)	Mean (mg/min)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
130,995	131,638	0.025	<0.1
<b>Influent Concentration</b>			
Target (mg/L)	Mean (mg/L)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
200	205	0.025	<0.1
<b>Background Concentration</b>			
Low (mg/L)	High (mg/L)	Mean (mg/L)	Acceptable Threshold (mg/L)
2	12	6.3	<20

*50% MTFR Results*

The 4-ft FDHC 50% MTFR test was conducted in accordance with the NJDEP HDS protocol at a target flow rate of 0.75 cfs. The 50% MTFR test results are shown in **Table 6**. Calibration results are shown in **Table 7**. Background and effluent results are shown in **Table 8**.

The 4-ft FDHC removed 53.8% of the test sediment at a flow rate of 0.75 cfs. **Table 9** shows that the QA/QC results for flow rate, feed rate and influent and effluent background concentrations were within the allowable parameters specified by the protocol.



**Table 6 – Summary of 4-ft FDHC 50% MTFR Test**

<b>Trial Date</b>	<b>Target Flow (cfs) / (gpm)</b>	<b>Detention Time (sec)</b>	<b>Target Sediment Concentration (mg/L)</b>	<b>Target Feed Rate (mg/min)</b>	<b>Test Duration (Min)</b>
11/04/2015	0.75 / 336.8	58	200	261,990	24:56
<b>Measured Values</b>					
<b>Mean Flow Rate (cfs) / (gpm)</b>	<b>Mean Influent Concentration<sup>1</sup> (mg/L)</b>	<b>Max. Water Temperature °C / °F</b>	<b>Mean Adjusted Effluent Concentration (mg/L)</b>	<b>Average Removal Efficiency</b>	<b>QA/QC Compliance</b>
0.75 / 337.5	204.7	25.1 / 77.2	94.6	53.8%	YES

<sup>1</sup> The mean influent concentration reported is calculated by dividing the entire mass of test sediment injected into the flow stream over the duration of the test divided by the total flow during the injection of test sediment.

**Table 7 – 4-ft FDHC 50% MTFR Test Calibration Results**

<b>Target Concentration</b>	<b>200 mg/L</b>	<b>Target Feed Rate</b>		<b>261,990 mg/min</b>	
<b>Sample ID</b>	<b>Sample Time (min)</b>	<b>Sample Mass (g)</b>	<b>Sample Duration (sec)</b>	<b>Feed Rate (mg/min)</b>	<b>Calculated Influent Concentration (mg/L)</b>
<b>Feed Rate 1</b>	0:00	132.832	30	265,664	208
<b>Feed Rate 2</b>	4:51	135.837	30	271,674	213
<b>Feed Rate 3</b>	9:42	129.512	30	259,024	203
<b>Feed Rate 4</b>	14:33	134.162	30	268,324	210
<b>Feed Rate 5</b>	19:24	129.638	30	259,276	203
<b>Feed Rate 6</b>	24:15	129.169	30	258,338	202
			<b>Mean</b>	<b>263,717</b>	<b>206</b>

**Table 8 – 4-ft FDHC 50% MTFR Background and Effluent Measurements**

<b>Sample ID</b>	<b>Time (min)</b>	<b>Concentration (mg/L)</b>		
<b>Background 1</b>	3:51	2		
<b>Background 2</b>	4:51	2		
<b>Background 3</b>	9:12	2		
<b>Background 4</b>	13:33	2		
<b>Background 5</b>	14:33	2		
<b>Background 6</b>	18:54	5		
<b>Background 7</b>	23:15	12		
<b>Background 8</b>	24:15	16		
<b>Sample ID</b>	<b>Time (min)</b>	<b>Concentration (mg/L)</b>	<b>Associated Background Concentration (mg/L)</b>	<b>Adjusted Concentration (mg/L)</b>
<b>Effluent 1</b>	3:51	90	2	88
<b>Effluent 2</b>	4:21	94	2	92
<b>Effluent 3</b>	4:51	99	2	97
<b>Effluent 4</b>	8:42	98	2	96
<b>Effluent 5</b>	9:12	100	2	98
<b>Effluent 6</b>	9:42	98	2	96
<b>Effluent 7</b>	13:33	95	2	93
<b>Effluent 8</b>	14:03	96	2	94
<b>Effluent 9</b>	14:33	95	2	93
<b>Effluent 10</b>	18:24	98	3.5	95
<b>Effluent 11</b>	18:54	103	5	98
<b>Effluent 12</b>	19:24	102	8.5	94
<b>Effluent 13</b>	23:15	106	12	94
<b>Effluent 14</b>	23:45	113	14	99
<b>Effluent 15</b>	24:15	108	16	92
	<b>Mean</b>	<b>99.7</b>	<b>5.1</b>	<b>94.6</b>

**Table 9 – 4-ft FDHC 50% MTFR Trial QA/QC Results**

<b>Flow Rate</b>			
Target (cfs / gpm)	Mean (cfs / gpm)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
0.75 / 336.8	0.75 / 337.5	0.008	<0.03
<b>Feed Rate</b>			
Target (mg/min)	Mean (mg/min)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
261,990	263,717	0.021	<0.1
<b>Influent Concentration</b>			
Target (mg/L)	Mean (mg/L)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
200	204.7	0.021	<0.1
<b>Background Concentration</b>			
Low (mg/L)	High (mg/L)	Mean (mg/L)	Acceptable Threshold (mg/L)
2	16	5.4	<20

*75% MTFR Results*

The 4-ft FDHC 75% MTFR test was conducted in accordance with the NJDEP HDS protocol at a target flow rate of 1.13 cfs (507 gpm). The 75% MTFR test results are shown in **Table 10**. Calibration results are shown in **Table 11**. Background and effluent results are shown in **Table 12**.

The 4-ft FDHC removed 51.3% of the test sediment at a flow rate of 1.13 cfs. **Table 13** shows that the QA/QC results for flow rate, feed rate and influent and effluent background concentrations were within the allowable parameters specified by the protocol.

**Table 10 – Summary of 4-ft FDHC 75% MTFR Test**

<b>Trial Date</b>	<b>Target Flow (cfs) / (gpm)</b>	<b>Detention Time (sec)</b>	<b>Target Sediment Concentration (mg/L)</b>	<b>Target Feed Rate (mg/min)</b>	<b>Test Duration (Min)</b>
11/06/2015	1.13 / 507.2	39	200	393,600	18:34
<b>Measured Values</b>					
<b>Mean Flow Rate (cfs / gpm)</b>	<b>Mean Influent Concentration<sup>1</sup> (mg/L)</b>	<b>Max. Water Temperature °C / °F</b>	<b>Mean Adjusted Effluent Concentration (mg/L)</b>	<b>Average Removal Efficiency</b>	<b>QA/QC Compliance</b>
1.13 / 507.5	191.7	24.9 / 76.8	93.3	51.3%	YES

<sup>1</sup> The mean influent concentration reported is calculated by dividing the entire mass of test sediment injected into the flow stream over the duration of the test divided by the total flow during the injection of test sediment.

**Table 11 – 4-ft FDHC 75% MTFR Test Calibration Results**

<b>Target Concentration</b>	<b>200 mg/L</b>	<b>Target Feed Rate</b>		<b>393,600 mg/min</b>	
<b>Sample ID</b>	<b>Sample Time (min)</b>	<b>Sample Mass (g)</b>	<b>Sample Duration (sec)</b>	<b>Feed Rate (mg/min)</b>	<b>Calculated Influent Concentration (mg/L)</b>
<b>Feed Rate 1</b>	0:00	132.141	20	396,423	206
<b>Feed Rate 2</b>	3:34	129.181	20	387,543	202
<b>Feed Rate 3</b>	7:08	127.602	20	382,806	199
<b>Feed Rate 4</b>	10:42	121.658	20	364,974	190
<b>Feed Rate 5</b>	14:16	122.327	20	366,981	191
<b>Feed Rate 6</b>	17:50	122.845	20	368,535	192
			<b>Mean</b>	<b>377,877</b>	<b>197</b>



**Table 12 – 4-ft FDHC 75% MTFR Background and Effluent Measurements**

<b>Sample ID</b>	<b>Time (min)</b>	<b>Concentration (mg/L)</b>		
<b>Background 1</b>	2:34	2		
<b>Background 2</b>	3:34	2		
<b>Background 3</b>	6:38	2		
<b>Background 4</b>	9:42	2		
<b>Background 5</b>	10:42	2		
<b>Background 6</b>	13:46	14		
<b>Background 7</b>	16:50	14		
<b>Background 8</b>	17:50	15		
<b>Sample ID</b>	<b>Time (min)</b>	<b>Concentration (mg/L)</b>	<b>Associated Background Concentration (mg/L)</b>	<b>Adjusted Concentration (mg/L)</b>
<b>Effluent 1</b>	2:34	87	2	85
<b>Effluent 2</b>	3:04	95	2	93
<b>Effluent 3</b>	3:34	96	2	94
<b>Effluent 4</b>	6:08	96	2	94
<b>Effluent 5</b>	6:38	98	2	96
<b>Effluent 6</b>	7:08	104	2	102
<b>Effluent 7</b>	9:42	99	2	97
<b>Effluent 8</b>	10:12	93	2	91
<b>Effluent 9</b>	10:42	100	2	98
<b>Effluent 10</b>	13:16	103	8	95
<b>Effluent 11</b>	13:46	98	14	84
<b>Effluent 12</b>	14:16	100	14	86
<b>Effluent 13</b>	16:50	102	14	88
<b>Effluent 14</b>	17:20	111	14.5	97
<b>Effluent 15</b>	17:50	115	15	100
	<b>Mean</b>	<b>99.8</b>	<b>6.5</b>	<b>93.3</b>

**Table 13 – 4-ft FDHC 75% MTFR Trial QA/QC Results**

<b>Flow Rate</b>			
Target (cfs / gpm)	Mean (cfs / gpm)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
1.13 / 507.2	1.13 / 507.5	0.006	<0.03
<b>Feed Rate</b>			
Target (mg/min)	Mean (mg/min)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
393,600	377,877	0.034	<0.1
<b>Influent Concentration</b>			
Target (mg/L)	Mean (mg/L)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
200	191.7	0.034	<0.1
<b>Background Concentration</b>			
Low (mg/L)	High (mg/L)	Mean (mg/L)	Acceptable Threshold (mg/L)
2	15	6.6	<20

*100% MTFR Results*

The 4-ft FDHC 100% MTFR test was conducted in accordance with the NJDEP HDS protocol at a target flow rate of 1.50 cfs (675 gpm). The 100% MTFR test results are shown in **Table 14**. Calibration results are shown in **Table 15**. Background and effluent results are shown in **Table 16**.

The 4-ft FDHC removed 46.0% of the test sediment at a flow rate of 1.50 cfs. **Table 17** shows that the QA/QC results for flow rate, feed rate and influent and effluent background concentrations were within the allowable parameters specified by the protocol.

**Table 14 – Summary of 4-ft FDHC 100% MTFR Test**

<b>Trial Date</b>	<b>Target Flow (cfs) / (gpm)</b>	<b>Detention Time (sec)</b>	<b>Target Sediment Concentration (mg/L)</b>	<b>Target Feed Rate (mg/min)</b>	<b>Test Duration (Min)</b>
11/10/2015	1.50 / 675.2	29	200	523,980	15:50
<b>Measured Values</b>					
<b>Mean Flow Rate (cfs / gpm)</b>	<b>Mean Influent Concentration (mg/L)<sup>1</sup></b>	<b>Max. Water Temperature °C / °F</b>	<b>Mean Adjusted Effluent Concentration (mg/L)</b>	<b>Average Removal Efficiency</b>	<b>QA/QC Compliance</b>
1.50 / 674.1	204.3	24.8 / 76.6	110.3	46.0%	YES

<sup>1</sup> The mean influent concentration reported is calculated by dividing the entire mass of test sediment injected into the flow stream over the duration of the test divided by the total flow during the injection of test sediment.

**Table 15 – 4-ft FDHC 100% MTFR Test Calibration Results**

<b>Target Concentration</b>	<b>200 mg/L</b>	<b>Target Feed Rate</b>		<b>523,980 mg/min</b>	
<b>Sample ID</b>	<b>Sample Time (min)</b>	<b>Sample Mass (g)</b>	<b>Sample Duration (sec)</b>	<b>Feed Rate (mg/min)</b>	<b>Calculated Influent Concentration (mg/L)</b>
<b>Feed Rate 1</b>	0:00	180.656	20	541,968	212
<b>Feed Rate 2</b>	3:00	180.055	20	540,165	212
<b>Feed Rate 3</b>	6:01	178.465	20	535,395	210
<b>Feed Rate 4</b>	9:01	175.592	20	526,776	206
<b>Feed Rate 5</b>	12:02	171.389	20	514,167	201
<b>Feed Rate 6</b>	15:02	167.750	20	503,250	197
			<b>Mean</b>	526,954	<b>206</b>

**Table 16 – 4-ft FDHC 100% MTFR Background and Effluent Measurements**

Sample ID	Time (min)	Concentration (mg/L)		
Background 1	2:00	4		
Background 2	3:00	2		
Background 3	5:31	2		
Background 4	8:01	2		
Background 5	9:01	2		
Background 6	11:32	6		
Background 7	14:02	12		
Background 8	15:02	15		
Sample ID	Time (min)	Concentration (mg/L)	Associated Background Concentration (mg/L)	Adjusted Concentration (mg/L)
Effluent 1	2:00	99	4	95
Effluent 2	2:30	107	3	104
Effluent 3	3:00	112	2	110
Effluent 4	5:01	111	2	109
Effluent 5	5:31	119	2	117
Effluent 6	6:01	116	2	114
Effluent 7	8:01	109	2	107
Effluent 8	8:31	114	2	112
Effluent 9	9:01	115	2	113
Effluent 10	11:02	119	4	115
Effluent 11	11:32	114	6	108
Effluent 12	12:02	123	9	114
Effluent 13	14:02	122	12	110
Effluent 14	14:32	132	13.5	119
Effluent 15	15:02	123	15	108
	<b>Mean</b>	<b>115.7</b>	<b>5.4</b>	<b>110.3</b>



**Table 17 – 4-ft FDHC 100% MTFR Trial QA/QC Results**

<b>Flow Rate</b>			
Target (cfs / gpm)	Mean (cfs / gpm)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
1.50 / 675.2	1.50 / 674.1	0.007	<0.03
<b>Feed Rate</b>			
Target (mg/min)	Mean (mg/min)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
523,980	526,954	0.03	<0.1
<b>Influent Concentration</b>			
Target (mg/L)	Mean (mg/L)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
200	204.3	0.03	<0.1
<b>Background Concentration</b>			
Low (mg/L)	High (mg/L)	Mean (mg/L)	Acceptable Threshold (mg/L)
2	15	5.6	<20

#### *125% MTFR Results*

The 4-ft FDHC 125% MTFR test was conducted in accordance with the NJDEP HDS protocol at a target flow rate of 1.88 cfs (842 gpm). The 125% MTFR test results are shown in **Table 18**. Calibration results are shown in **Table 19**. Background and effluent results are shown in **Table 20**.

The 4-ft FDHC removed 43.5% of the test sediment at a flow rate of 1.88 cfs. **Table 21** shows that the QA/QC results for flow rate, feed rate and influent and effluent background concentrations were within the allowable parameters specified by the protocol.

**Table 18 – Summary of 4-ft FDHC 125% MTFR Test**

<b>Trial Date</b>	<b>Target Flow (cfs / gpm)</b>	<b>Detention Time (sec)</b>	<b>Target Sediment Concentration (mg/L)</b>	<b>Target Feed Rate (mg/min)</b>	<b>Test Duration (Min)</b>
11/16/2015	1.88 / 842.0	23	200	634,499	13:59
<b>Measured Values</b>					
<b>Mean Flow Rate (cfs / gpm)</b>	<b>Mean Influent Concentration<sup>1</sup> (mg/L)</b>	<b>Max. Water Temperature °C / °F</b>	<b>Mean Adjusted Effluent Concentration (mg/L)</b>	<b>Average Removal Efficiency</b>	<b>QA/QC Compliance</b>
1.88 / 842.3	201.8	24.8 / 76.7	114.0	43.5%	YES

<sup>1</sup> The mean influent concentration reported is calculated by dividing the entire mass of test sediment injected into the flow stream over the duration of the test divided by the total flow during the injection of test sediment.

**Table 19 – 4-ft FDHC 125% MTFR Test Calibration Results**

<b>Target Concentration</b>	<b>200 mg/L</b>	<b>Target Feed Rate</b>		<b>634,499 mg/min</b>	
<b>Sample ID</b>	<b>Sample Time (min)</b>	<b>Sample Mass (g)</b>	<b>Sample Duration (sec)</b>	<b>Feed Rate (mg/min)</b>	<b>Calculated Influent Concentration (mg/L)</b>
<b>Feed Rate 1</b>	0:00	230.390	20	691,170	217
<b>Feed Rate 2</b>	2:40	221.852	20	665,556	209
<b>Feed Rate 3</b>	5:21	224.366	20	673,098	211
<b>Feed Rate 4</b>	8:01	218.425	20	655,275	206
<b>Feed Rate 5</b>	10:42	210.833	20	632,499	198
<b>Feed Rate 6</b>	13:22	204.864	20	614,592	193
			<b>Mean</b>	655,365	<b>206</b>

**Table 20 – 4-ft FDHC 125% MTFR Background and Effluent Measurements**

<b>Sample ID</b>	<b>Time (min)</b>	<b>Concentration (mg/L)</b>		
<b>Background 1</b>	1:40	2		
<b>Background 2</b>	2:40	2		
<b>Background 3</b>	4:51	2		
<b>Background 4</b>	7:01	2		
<b>Background 5</b>	8:01	2		
<b>Background 6</b>	10:12	5		
<b>Background 7</b>	12:22	11		
<b>Background 8</b>	13:22	11		
<b>Sample ID</b>	<b>Time (min)</b>	<b>Concentration (mg/L)</b>	<b>Associated Background Concentration (mg/L)</b>	<b>Adjusted Concentration (mg/L)</b>
<b>Effluent 1</b>	1:40	110	2	108
<b>Effluent 2</b>	2:10	121	2	119
<b>Effluent 3</b>	2:40	108	2	106
<b>Effluent 4</b>	4:21	128	2	126
<b>Effluent 5</b>	4:51	119	2	117
<b>Effluent 6</b>	5:21	119	2	117
<b>Effluent 7</b>	7:01	114	2	112
<b>Effluent 8</b>	7:31	115	2	113
<b>Effluent 9</b>	8:01	115	2	113
<b>Effluent 10</b>	9:42	119	3.5	116
<b>Effluent 11</b>	10:12	119	5	114
<b>Effluent 12</b>	10:42	114	8	106
<b>Effluent 13</b>	12:22	122	11	111
<b>Effluent 14</b>	12:52	124	11	113
<b>Effluent 15</b>	13:22	130	11	119
	<b>Mean</b>	<b>118.5</b>	<b>4.5</b>	<b>114.0</b>

**Table 21 – 4-ft FDHC 125% MTR Trial QA/QC Results**

<b>Flow Rate</b>			
Target (cfs / gpm)	Mean (cfs / gpm)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
1.88 / 842.0	1.88 / 842.3	0.005	<0.03
<b>Feed Rate</b>			
Target (mg/min)	Mean (mg/min)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
634,499	655,365	0.04	<0.1
<b>Influent Concentration</b>			
Target (mg/L)	Mean (mg/L)	Coef. Of Variance	Acceptable Parameters Coef. Of Variance
200	201.8	0.04	<0.1
<b>Background Concentration</b>			
Low (mg/L)	High (mg/L)	Mean (mg/L)	Acceptable Threshold (mg/L)
2	11	4.6	<20

***Excluded Data/Results***

Section 5.D, *Verification Report Requirements: Supporting Documentation* of the NJDEP Process document requires that all data from performance evaluation test runs excluded from the computation of the removal rate or verification analysis be disclosed. No test runs were aborted during the testing process, and no data from tests that did not meet protocol requirements have been excluded from the results presented in the previous section of this report.

One duplicate sample was collected for each effluent water quality sample. These samples were sent to an independent analytical laboratory for particle size distribution analysis. As effluent particle size analysis is not required by the NJDEP protocol, the data are not presented in this report.

The protocol requires that three samples of removal efficiency test sediment be collected and analyzed for particle size distribution, and that the average particle size of the three samples be reported. During the collection of the three sediment samples, a fourth sample was taken in case of spoilage or loss of one of the samples. This fourth sample was analyzed for particle size distribution and met the PSD specified by the protocol. The fourth sample was not included in the reported average particle size distribution, as the protocol specifically states that three samples shall be analyzed for particle size distribution.

### ***Annualized Weighted TSS Removal Efficiency***

The NJDEP-specified annual weighted TSS removal efficiency calculation is shown in **Table 22** using the results from the removal efficiency testing.

***Testing in accordance with the provisions detailed in the NJDEP HDS Protocol demonstrate that the 4-ft FDHC achieved a 52.93% annualized weighted TSS removal at an MTFR of 1.50 cfs (53.6 gpm/sf). This testing demonstrates that the 4-ft FDHC exceeds the NJDEP requirement that HDS devices demonstrate at least 50% weighted annualized TSS removal efficiency at the MTFR.***

**Table 22 – Annualized Weighted TSS Removal of the 4-ft FDHC**

<b>% MTFR</b>	<b>Mean Flow Rate Tested (cfs)</b>	<b>Actual % MTFR</b>	<b>Measured Removal Efficiency</b>	<b>Annual Weighting Factor</b>	<b>Weighted Removal Efficiency</b>
25	0.38	25.3	61.1%	0.25	15.28%
50	0.75	50.0	53.8%	0.3	16.14%
75	1.13	75.3	51.3%	0.2	10.26%
100	1.50	100.0	46.0%	0.15	6.90%
125	1.88	125.3	43.5%	0.1	4.35%
<b>Weighted Annualized TSS Removal Efficiency</b>					<b>52.93%</b>

### **4.3 Test Sediment PSD Analysis - Scour Testing**

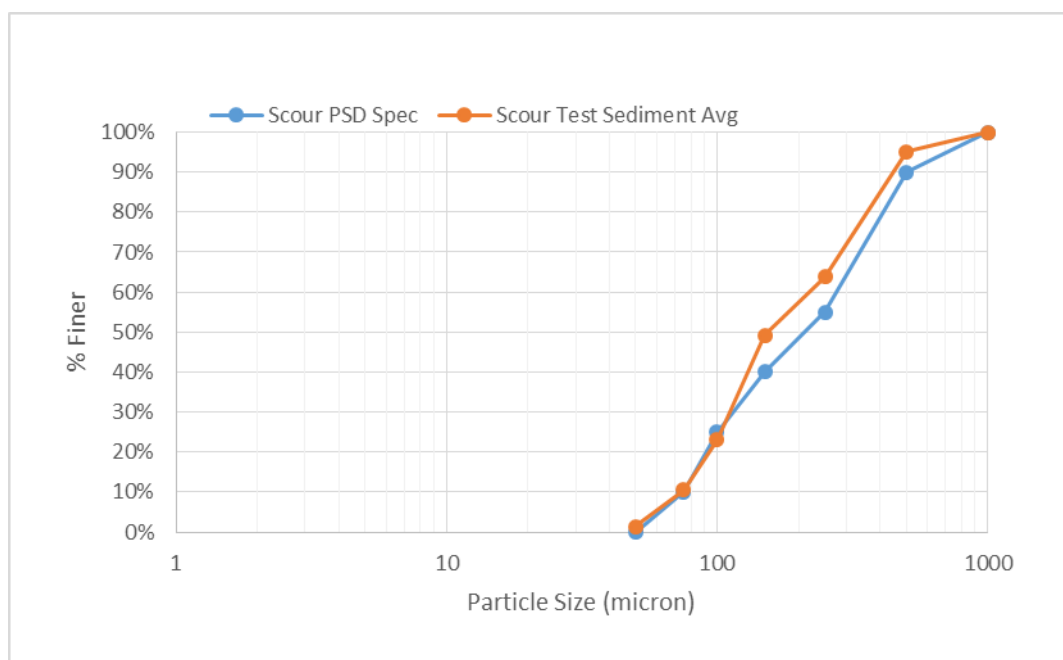
The scour test sediment, as described in Section 2.3 *Test Sediment*, was high purity (99.8% SiO<sub>2</sub>) silica blended by an independent commercial silica supplier to meet the particle size distribution specified by the NJDEP HDS protocol. Three 250 mL subsamples were taken from the sump and analyzed for particle size analysis at the Hydro International lab under the supervision of the independent observer.

The results showed that the average test sediment was found to meet the particle size distribution specified by the protocol (**Table 23**), with no measured value being greater than two percentage points greater than the target percent finer value. A comparison of the PSD specified by the protocol and average PSD of the test sediment is shown in **Figure 10**.



**Table 23 – Scour Test Sediment Particle Size Distribution Comparison**

Particle Size (µm)	% Finer					% Difference from Spec
	NJDEP Spec	Sample 1	Sample 2	Sample 3	Average	
1000	100	100.0	100.0	100.0	100.0	0.0
500	90	95.1	95.0	95.2	95.1	-5.1
250	55	64.0	64.6	62.8	63.8	-8.8
150	40	49.8	50.0	47.8	49.2	-9.2
100	25	23.4	23.6	22.0	23.0	2.0
75	10	10.6	11.0	10.0	10.5	-0.5
50	0	1.3	1.6	1.3	1.4	-1.4



**Figure 10 Scour Test Sediment PSD vs Protocol Specification**

#### 4.4 Scour Testing for Online Installation

The FDHC underwent scour testing in line with Section 4 of the NJDEP HDS protocol at a flow rate greater than 200% of its MTFR in order to verify its suitability for online use. For the 4-ft FDHC with an MTFR of 1.50 cfs (673 gpm) the average scour test flow rate had to be at least 3.0 cfs (1,344 gpm). The average flow rate for the scour test was 3.24 cfs, which represents 216% of the MTFR. The maximum water temperature during testing was 76.8°F. The flow rate COV was 0.007. Background concentrations measured 2 mg/L for all samples, which complies with the 20 mg/L maximum background concentration specified by the test protocol. Flow and background concentration measurements are shown in **Table 24**.

**Table 24 – Flow and Background Concentration Results for 4-ft FDHC Scour Testing**

Trial Date		11/18/2015	Average Flow Rate =	3.24cfs
Mean Temperature		24.5°C / 76.1°F	Flow Rate COV	0.007
Sample ID	Time (min)	Concentration (mg/L)		
Background 1	2:00	2		
Background 2	6:00	2		
Background 3	10:00	2		
Background 4	14:00	2		
Background 5	18:00	2		
Background 6	22:00	2		
Background 7	26:00	2		
Background 8	30:00	2		

Unadjusted effluent concentrations ranged from 2 mg/L to 4 mg/L with a mean of 2.1 mg/L. When adjusted for background concentrations, the effluent concentrations range from 0 to 2 mg/L. The mean adjusted effluent concentration was 0.1 mg/L (**Table 25**).

**Table 25 – Effluent Concentration Results for 4-ft FDHC Scour Test at 216% MTR**

Sample ID	Time (min)	Effluent Concentration with Background Concentrations (mg/L)	Background Concentration (mg/L)	Adjusted Effluent Concentration (mg/L)
Effluent 1	2:00	2	2	0
Effluent 2	4:00	2	2	0
Effluent 3	6:00	2	2	0
Effluent 4	8:00	2	2	0
Effluent 5	10:00	2	2	0
Effluent 6	12:00	2	2	0
Effluent 7	14:00	2	2	0
Effluent 8	16:00	2	2	0
Effluent 9	18:00	2	2	0
Effluent 10	20:00	2	2	0
Effluent 11	22:00	2	2	0
Effluent 12	24:00	2	2	0
Effluent 13	26:00	2	2	0
Effluent 14	28:00	4	2	2
Effluent 15	30:00	2	2	0
	<b>Mean</b>	<b>2.1</b>	<b>2</b>	<b>0.1</b>

***Excluded Data/Results***

The protocol requires the disclosure and discussion of any data collected as a part of the testing process that is excluded from the reported results. No test runs were aborted during the scour testing process, and no data from tests that did not meet protocol requirements have been excluded from the results presented in the scour testing section of this report.

**5. Design Limitations**

The FDHC is an engineered system for which Hydro International's engineers work with site designers to generate a detailed engineering submittal package for each installation. As such, design limitations are typically identified and managed during the design process. Design parameters and limitations are discussed in general terms below.

### *Required Soil Characteristics*

The FDHC is a flow-through system contained within a water tight manhole. Therefore the FDHC can be installed and function as intended in all soil types.

### *Slope of Drainage Pipe*

Hydro International recommends contacting our design engineers when the FDHC is going to be installed on a drainage line with a slope greater than 10%. With steeply sloping pipe, site specific parameters such as pipe size, online vs. offline arrangement of the FDHC and the frequency of peak flow are taken into consideration by the Hydro International design team.

### *Maximum Flow Rate*

The maximum treatment flow rate (MTFR) of the FDHC is dependent upon model size. The recommended maximum peak flow rate is dependent on FDHC model size and other design and performance specifications. Hydro International recommends contacting their engineering staff with questions about managing high peak flow rates.

### *Maintenance Requirements*

The FDHC should be inspected and maintained in line with the recommendations and guidelines set forth in the Operation and Maintenance Manual at: ([http://www.hydro-int.com/UserFiles/downloads/FD\\_O%2BM\\_F1512.pdf](http://www.hydro-int.com/UserFiles/downloads/FD_O%2BM_F1512.pdf)). The sediment accumulation rate in the FDHC is dependent on site-specific characteristics such as site usage and topography. A more detailed discussion of inspection and maintenance requirements is discussed later in Section 6.

### *Driving head*

Testing conducted according to ASTM Standard Test Methods C1745 / C1745M – 11: Standard Test Method for Measurement of Hydraulic Characteristics of Hydrodynamic Stormwater Separators and Underground Settling Devices showed that the headloss across the FDHC is a function of flow rate and pipe velocities. Generally, the FDHC headloss is estimated using Equation 3.

#### **Equation 3 – Flow dependent headloss of the FDHC**

Given  $H_L$  = FDHC headloss

$H_u$  = measured pressure head or water elevation in the inlet or upstream pipe

$H_d$  = measured pressure head or water elevation in the outlet or downstream pipe

$G$  = gravitational constant, 32.2 ft/sec<sup>2</sup>

$V_u, V_d$  = calculated average flow velocities in the upstream and downstream pipes, respectively

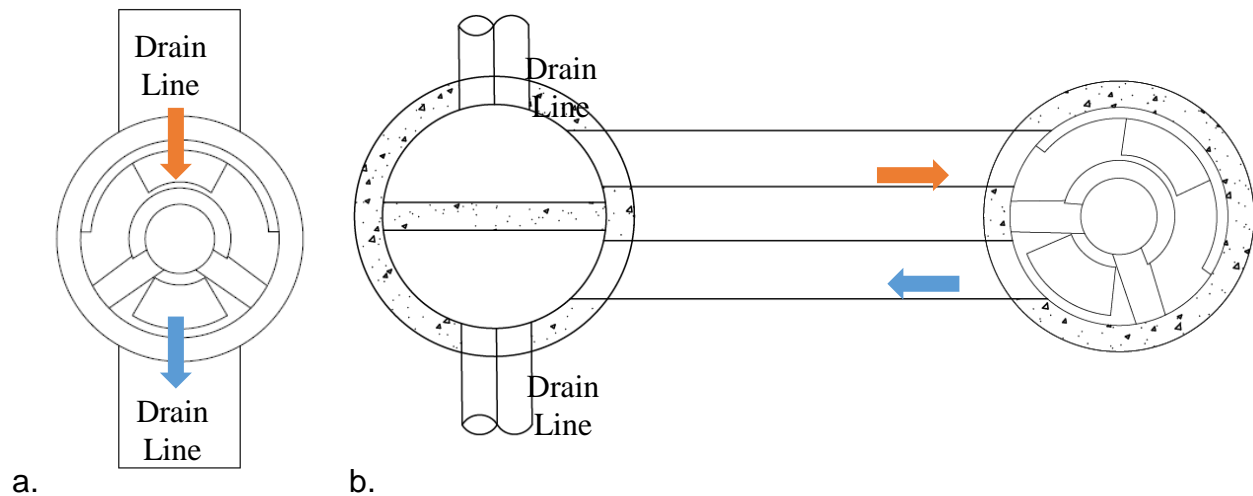
$$H_L = (h_u + \frac{V_u^2}{2g}) - (h_d + \frac{V_d^2}{2g})$$

### *Installation limitations*

Pick weights and installation procedures vary slightly with model size. Hydro International provides contractors with project-specific unit pick weights and installation instructions prior to delivery.

### *Configurations*

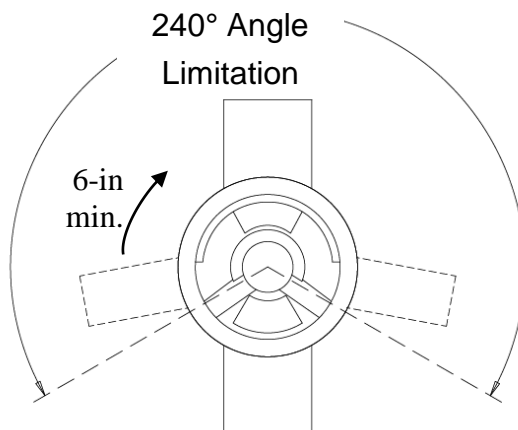
The FDHC was designed for online applications in which the inlet and outlet are tied directly into the main drainage line, however the device can also be installed offline using external junction manholes (**Figure 11a-b**).



**Figure 11 a) FDHC Online Application; b) FDHC Offline Application**

In some cases, multiple inlet pipes can be accommodated depending on pipe size and pipe angles as long as at least six inches of concrete remains between inlet pipe knockouts and pipe angles are within 240° of the outlet centerline (**Figure 12**). Contact Hydro International for design assistance with multiple inlet pipes.





**Figure 12 FDHC Design Accommodates Various Inlet Pipe Configurations**

### *Load Limitations*

Standard FDHC units are designed for HS-20 loading. Contact Hydro International engineering staff when heavier load ratings are required.

### *Pretreatment Requirements*

The FDHC has no pre-treatment requirements.

### *Limitations on Tail water*

As the FDHC includes an internal bypass, Hydro International recommends working with their engineering team if tail water is present to increase the available driving head to ensure that the full water quality treatment flow rate is treated prior to internal bypass.

### *Depth to seasonal high water table*

Although the functionality of the FDHC is not impacted by high groundwater, Hydro International recommends consulting their engineering staff to determine whether the addition of anti-flotation collars to the base of the FDHC chamber are necessary to counterbalance buoyant forces.

### *Pipe Size*

Each FDHC model has a maximum recommended inlet and outlet pipe size. When the diameter of the main storm drain line exceeds the maximum FDHC pipe size, Hydro International recommends contacting their engineering team. In some circumstances larger pipe sizes can be safely accommodated; otherwise Hydro International recommends the FDHC be designed in an offline configuration. The maximum recommended inlet and outlet pipe diameter for each FDHC model are shown in **Table A-2** of the Verification Appendix.

## 6. Maintenance Plans

The FDHC treats stormwater by removing pollutants from stormwater runoff and capturing them in the pollutant storage sump. Periodic removal of these captured pollutants is essential to the continuous, long-term functioning of the FDHC. When sediment and oil storage capacities are reached, the FDHC's ability to capture and store removed sediment and oil will be compromised.

Inspection and maintenance of the FDHC are simple procedures conducted from the surface. Neither inspection nor maintenance require purchasing spare parts or tools from Hydro International. The FDHC has one centrally located 30-in manhole lid to provide inspection and maintenance access to both the internal bypass chamber and treatment chamber.

### *Inspection*

The required frequency of cleanout depends on site use and other site specific characteristics and should therefore be determined by inspecting the unit after installation. During the first year of operation, the unit should be inspected at least every six months to determine the rate of sediment and floatables accumulation. More frequent inspections are recommended at sites that would generate heavy solids loads, like parking lots with winter sanding or unpaved maintenance lots. A dipstick can be used to measure accumulated oil; a sediment probe can be used to determine the level of accumulated solids stored in the sump.

Hydro International recommends that the units are cleaned when sediment volumes reach 50% sump capacity. The standard sediment storage depth in the FDHC is 18 inches. Because FDHC model sizes vary in diameter, pollutant storage volumes vary with model size as shown in **Table 26**. When sediment and oil depths are measured during inspection, they should be recorded on the Operation & Maintenance manual log and compared to the as-built drawings of the FDHC to assess whether accumulated sediment has reached 9 inches in depth.

**Table 26 – Pollutant Storage Capacities of the FDHC**

Model	Oil Storage Volume (gal)	Sediment Volume at 50% Sump Capacity (yd <sup>3</sup> )	Sediment Depth at 50% Sump Capacity (in)	Sump Volume (yd <sup>3</sup> )	Sump Depth (in)
3-ft FDHC	125	0.20	9	0.4	18
4-ft FDHC	191	0.35	9	0.7	18
5-ft FDHC	300	0.55	9	1.1	18
6-ft FDHC	496	0.8	9	1.6	18
7-ft FDHC	720	1.05	9	2.1	18
8-ft FDHC	1,002	1.4	9	2.8	18

## *Maintenance*

The interval of required clean-out should be determined by post-installation inspection of pollutant accumulation rates. If post-installation inspection cannot be conducted for some reason, Hydro International recommends the FDHC be cleaned out at least once per year. There is no need for man entry into the FDHC during maintenance. However, if man entry does occur then proper confined space entry procedures must be followed.

Floatable trash and debris can be removed by lifting the floatable access lid and using a netted skimming pole or a vactor truck to skim trash from the surface of the standing water. Accumulated oil must be vactored from the surface using a vactor truck or sump vac. Accumulated sediment can be removed by lifting the central access lid and dropping a vactor hose down the center shaft to the sump. The entire sump liquid volume does not necessarily need to be removed from the FDHC during maintenance.

When all pollutants have been removed from the FDHC, the manhole lids should be put securely back in place. Removed pollutants should be disposed of in accordance with local regulations and ordinances.

## **7. Statements**

The following signed statements from the manufacturer, third-party observer and NJCAT are required to complete the NJCAT verification process.

In addition, it should be noted that this report has been subjected to public review (e.g. stormwater industry) and all comments and concerns have been satisfactorily addressed.

December 21, 2015

Dr. Richard Magee, Sc.D., P.E., BCEE  
Technical Director  
New Jersey Corporation for Advanced Technology  
c/o Center for Environmental Systems  
Stevens Institute of Technology  
One Castle Point on Hudson  
Hoboken, NJ 07030

Re: Verification of First Defense® HC to NJDEP HDS Laboratory Testing Protocol

Dear Dr. Magee:

Hydro International's First Defense® HC (FDHC) vortex separator for stormwater treatment recently underwent verification testing according to the NJDEP HDS Laboratory Testing Protocol. As required by the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology", this letter serves as Hydro International's statement that all procedures and requirements identified in the aforementioned protocol and process document were met or exceeded. The 4-ft FDHC removal efficiency and scour tests conducted at Hydro International's laboratory facility in Portland, Maine were done so under the direct supervision of FB Environmental Associates. All water quality samples were analyzed by the independent analytical lab, Maine Environmental Laboratory. The removal efficiency particle size distribution was analyzed by the independent analytical laboratory, GeoTesting Express. The scour test particle size distribution was analyzed at Hydro International's facility under the supervision of FB Environmental Associates. Additionally, the preparation of the verification report and the documentation contained therein fulfill the submission requirements of the process document and protocol.

If you have any questions or comments regarding the verification of the FDHC, please do not hesitate to contact us.

Sincerely,



Lisa Lemont, CPSWQ  
Business Development Manager

## Statement of Third Party Observer



### STATEMENT OF THIRD PARTY OBSERVER

To: Lisa Lemont, Hydro International, Portland, Maine  
From: Forrest Bell, FB Environmental Associates  
Subject: Third Party Review under *Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology* (NJDEP, January 25 2013)<sup>1</sup>  
Date: December 31, 2015  
cc: Andrew Anastasio, Hydro International; Jeremy Fink, Hydro International  
Margaret Burns, FB Environmental Associates

#### Statement of Third Party Observer

FB Environmental has served as the third-party observer for tests performed by Hydro International in October through December 2015. The tests assessed the First Defense HC Stormwater Treatment Device as a 50% Total Suspended Solids (TSS) removal device under the New Jersey Department of Environmental Protection certification. Tests were performed by Hydro International staff at their laboratory located at 94 Hutchinson Drive in Portland, Maine, to meet the standards described in *Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology* (NJDEP, January 25 2013)<sup>1</sup>. On May 10, 2014, we also submitted a statement of qualifications, as required by NJCAT MTD process.

A member of our staff verified compliance with the laboratory test protocol above, and our staff member was physically present to observe the full duration of all laboratory testing. We have also reviewed the data, calculations, and conclusions associated with the removal efficiency testing in the *Verification Testing Report for the First Defense® HC Stormwater Treatment Device* by Hydro International, dated December 29, 2015, and state that they conform to what we saw during our supervision as third-party observer.

A handwritten signature in cursive script that reads 'Forrest Bell'.

December 31, 2015

Signed:

Date:

<sup>1</sup> Available at <http://www.nj.gov/dep/stormwater/treatment.html>



## Statement of Disclosure



### STATEMENT OF DISCLOSURE – THIRD PARTY OBSERVER

To: Lisa Lemont, Hydro International, Portland, Maine  
From: Forrest Bell, FB Environmental Associates  
Subject: Third Party Observer Statement of Disclosure under *Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology* (NJDEP, January 25 2013)<sup>1</sup>  
Date: December 31, 2015  
cc: Andrew Anastasio, Hydro International  
Margaret Burns, FB Environmental Associates

#### Statement of Disclosure – Third Party Observer

FB Environmental has no financial conflict of interest regarding the test results of the stormwater device testing outlined in the *Verification Testing Report for the First Defense® HC Stormwater Treatment Device* by Hydro International, dated December 29, 2015.

#### Disclosure Record

FB Environmental has provided the service of third party observer for tests performed by Hydro International in October through December of 2015. The tests assessed the First Defense HC Stormwater Treatment Device as a 50% Total Suspended Solids (TSS) removal device under the New Jersey Department of Environmental Protection certification as outlined in the *Verification Testing Report for the First Defense® HC Stormwater Treatment Device* by Hydro International, dated December 29, 2015. Beyond this, FB Environmental and Hydro International have no relationships that would constitute a conflict of interest, as outlined in *Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology* (NJDEP 2013). For example, we have no ownership stake, do not receive commissions, do not have licensing agreements, and do not receive funds or grants beyond those associated with the testing program.

A handwritten signature in black ink that reads 'Forrest Bell'.

December 31, 2015

Signed:

Date:

<sup>1</sup> Available at <http://www.nj.gov/dep/stormwater/treatment.html>



**Center for Environmental Systems  
Stevens Institute of Technology  
One Castle Point  
Hoboken, NJ 07030-0000**

January 9, 2016

Titus Magnanao  
NJDEP  
Division of Water Quality  
Bureau of Non-Point Pollution Control  
401-02B  
PO Box 420  
Trenton, NJ 08625-0420

Dear Mr. Magnanao,

Based on my review, evaluation and assessment of the testing conducted on the First Defense<sup>®</sup> HC (FDHC) Stormwater Treatment Device by Hydro International and observed by FB Environmental Associates, the test protocol requirements contained in the “New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device” (NJDEP HDS Protocol) were met or exceeded. Specifically:

*Test Sediment Feed*

The mean PSD of Hydro International's test sediments comply with the PSD criteria established by the NJDEP HDS protocol. The Hydro International removal efficiency test sediment PSD analysis was plotted against the NJDEP removal efficiency test PSD specification. The test sediment was shown to be slightly finer than the sediment blend specified by the protocol. The Hydro International scour test sediment PSD analysis was plotted against the NJDEP removal efficiency test PSD specification and shown to be much finer than specified by the protocol.

### *Removal Efficiency Testing*

In accordance with the NJDEP HDS Protocol, removal efficiency testing was executed on the 4-ft. laboratory unit in order to establish the ability of the FDHC to remove the specified test sediment at 25%, 50%, 75%, 100% and 125% of the target MTFR. Prior to the start of testing Hydro International reviewed existing data and decided to utilize a target MTFR of 675 gpm (1.50 cfs). This target was chosen based on the ultimate goal of demonstrating greater than 50% annualized weighted solids removal as defined in the NJDEP HDS Protocol. The flow rates, feed rates and influent concentration all met the NJDEP HDS test protocol's coefficient of variance requirements and the background concentration for all five test runs never exceeded 20 mg/L.

### *Scour Testing*

In order to demonstrate the ability of the FDHC to be used as an online treatment device scour testing was conducted at greater than 200% of MTFR in accordance with the NJDEP HDS Protocol. The average flow rate during the online scour test was 3.24 cfs, which represents 216% of the MTFR (MTFR = 1.50 cfs). Background concentrations were 2 mg/L throughout the scour testing, which complies with the 20 mg/L maximum background concentration specified by the test protocol. Unadjusted effluent concentrations ranged from 2 mg/L to 4 mg/L with a mean of 2.1 mg/L. When adjusted for background concentrations, the effluent concentrations range from 0 to 2 mg/L with a mean of 0.1 mg/L. These results confirm that the 4-ft. FDHC did not scour at 216% MTFR and meets the criteria for online use.

### *Maintenance Frequency*

The predicted maintenance frequency for all models is 44 months.

Sincerely,



Richard S. Magee, Sc.D., P.E., BCEE

## 8. References

ASTM D422-63. *Standard Test Method for Particle-size Analysis of Soils*.

ASTM D3977-97. *Standard Test Methods for Determining Concentrations in Water Samples*.

Hydro International 2014. *Quality Assurance Project Plan for FDHC® NJDEP Testing*. Prepared by H.I.L. Technology, Inc. dba Hydro International. October, 2015.

NJDEP 2013a. *New Jersey Department of Environmental Protection Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology*. Trenton, NJ. January 25, 2013.

NJDEP 2013b. *New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device*. Trenton, NJ. January 25, 2013.

## **VERIFICATION APPENDIX**



## ***Introduction***

- Manufacturer – Hydro International, 94 Hutchins Drive, Portland, ME 04102. *General Phone: (207)756-6200. Website: [www.hydro-int.com/us](http://www.hydro-int.com/us).*
- MTD – First Defense® HC Stormwater Treatment Device. Verified First Defense® HC Models are shown in **Table A-1**.
- TSS Removal Rate – 50%
- On-line installation

## ***Detailed Specification***

- NJDEP sizing tables attached as **Table A-1** and **Table A-2**.
- New Jersey requires that the peak flow rate of the NJWQ Design Storm event of 1.25 inch in 2 hours shall be used to determine the appropriate size for the MTD.
- Pick weights and installation procedures vary slightly with model size. Hydro International provides contractors with project-specific unit pick weights and installation instructions prior to delivery.
- Maximum recommended sediment depth prior to cleanout is 9 inches for all model sizes.
- For a reference maintenance plan, download the First Defense® HC Operation and Maintenance Manual at:  
[http://www.hydro-int.com/UserFiles/downloads/FD\\_O%2BM\\_F1512.pdf](http://www.hydro-int.com/UserFiles/downloads/FD_O%2BM_F1512.pdf)
- Under N.J.A.C. 7:8-5.5, NJDEP stormwater design requirements do not allow a hydrodynamic separator such as the First Defense® HC to be used in series with another hydrodynamic separator to achieve an enhanced total suspended solids (TSS) removal rate.

**Table A-1 MTFRs and Required Sediment Removal Intervals for FDHC Models**

<b>First Defense® HC Model</b>	<b>Manhole Diameter (ft)</b>	<b>NJDEP 50% TSS Maximum Treatment Flow Rate (cfs)</b>	<b>Treatment Area (ft²)</b>	<b>Hydraulic Loading Rate (gpm/ft²)</b>	<b>50% Max Sediment Storage Volume (ft³)</b>	<b>Required Sediment Removal Interval¹ (Months)</b>
3-ft	3	0.85	7.1	53.58	5.30	44
4-ft	4	1.50	12.6	53.58	9.42	44
5-ft	5	2.35	19.6	53.58	14.7	44
6-ft	6	3.38	28.3	53.58	21.2	44
7-ft	7	4.60	38.5	53.58	28.9	44
8-ft	8	6.00	50.2	53.58	37.7	44
<p>¹ Required sediment removal interval was calculated using the equation specified in Appendix B Part B of the NJDEP Laboratory Protocol for HDS MTDs:</p> <p align="center"><b>Sediment Removal Interval (months) = <u>(50% HDS MTD Max Sediment Storage Volume * 3.57)</u></b></p> <p align="center"><b>(MTFR * TSS Removal Efficiency)</b></p>						

**Table A-2 Standard Dimensions for FDHC Models**  
(Revised January 2017)

<b>FDHC Model and Manhole Diameter (ft)</b>	<b>Maximum Treatment Flow Rate (cfs)</b>	<b>50% Max Sediment Storage Volume (ft<sup>3</sup>)</b>	<b>Chamber Depth (ft)</b>	<b>Treatment Chamber Depth <sup>1</sup> (ft)</b>	<b>Sediment Sump Depth (ft)</b>	<b>Aspect Ratio Treatment Depth: Diameter</b>	<b>Maximum Pipe Diameter (in)</b>
3-ft	0.85	5.30	3.75	3.00	1.5	1.00	18
4-ft	1.50	9.42	5.00	4.25	1.5	1.06	24
5-ft	2.35	14.7	5.25	4.50	1.5	0.90	24
6-ft	3.38	21.2	6.25	5.50	1.5	0.92	32
7-ft	4.60	28.9	7.25	6.50	1.5	0.93	42
8-ft	6.00	37.7	8.00	7.25	1.5	0.91	48
<sup>1</sup> Treatment Chamber Depth is the chamber depth minus ½ the sediment sump depth. Larger models (>250% MTFR of the tested unit) must be geometrically proportionate to the tested unit (4' model). A variance of 15% is allowable. For units <250% MTFR (5 and 6-ft models) the depth must be equal or greater than the depth of the unit treated.							



## Town of Arlington, Massachusetts

---

### Working Session: 1021-1025 Massachusetts Avenue (Continued)

#### Summary:

III. Working Session: 1021 – 1025 Massachusetts Avenue (Continued)

Documents: Site alternate plans 1 and 2, floor plan, exterior rendering, urban park cost estimate, correspondence between Jacquelyn Maggiore (Maggiore) and Katarina Ilic (Millbrook Condominium Association), StormTech stacked system summary

Applicant proposes to demolish two (2) structures and associated driveways, parking lots, and site appurtenances, and construct a 48-unit, 5-story affordable housing condominium building (under Chapter 40B) with ground-level parking garage and retail space. Portions of the proposed project are located within the outer portion of Riverfront Area associated with Mill Brook. Site grading, a retaining wall, erosion controls, invasive species management and native revegetation, establishment of a meadow, and stormwater management are proposed.

#### ATTACHMENTS:

Type	File Name	Description
Reference Material	1021___1025_Mass_Ave_Urban_Park_Cost_Estimate.pdf	1021&1025 Mass Ave Urban Park Cost Estimate
Reference Material	21-32_SITE-ALT-1.pdf	21-32 Site - Alt 1 1021&1025 Mass Ave
Reference Material	21-32_SITE-ALT-2.pdf	21-32 Site - Alt 2 1021&1025 Mass Ave
Reference Material	Birdseye-.CROP.220127.pdf	Birdseye CROP 220127
Reference Material	MASS.AVE.A1.1_21.12.10.pdf	Mass Ave A1.1_21.12.10
Reference Material	MASS.AVE.A1.2_21.12.10.pdf	Mass Ave A1.2_21.12.10
Reference Material	MASS.AVE.A1.3_21.12.10.pdf	Mass Ave A1.3_21.12.10
Reference Material	Stacked_Systems_-_8-19-14_[Compatibility_Mode].pdf	Stacked Systems - 8-19-14
Reference Material	Millbrook_Condo_Correspondence.pdf	Millbrook Condo Correspondence



1021 & 1025 Massachusetts Avenue  
Arlington, MA  
Urban Park Construction Cost Estimate  
January 27, 2022

Item	Unit	Quantity	Low Cost Range	High Cost Range
Remove and dispose of approx. 100 trees and ground debris <i>See Exhibit A: Proposal from Arbor Tree Service</i>	LS	1	78,500.00	78,500.00
Budget to Remove and Dispose of tree stumps	LS	1	12,000.00	15,000.00
Remove and dispose of 12" of topsoil	CYD	330	7,500.00	9,000.00
Furnish and install clean fill to level area	LS	1	4,500.00	6,500.00
Budget for landscape walls, retaining walls, and paver walkways	LS	1	25,000.00	35,000.00
Furnish and install 12" of new organic topsoil	CYD	330	6,600.00	8,000.00
Budget to Purchase and deliver native sapling trees, shrubs and ferns	LS	1	5,000.00	8,500.00
Budget to Install plantings	LS	1	25,000.00	30,000.00
Professional design services: LEC & Certified Landscape Architect	LS	1	15,000.00	20,000.00
Maintenance	Annual	1	3,500.00	4,500.00
10% Contingency	LS	1	18,260.00	21,500.00
<b>Total</b>			<b>200,860.00</b>	<b>236,500.00</b>





Date: January 26th, 2022

To: Client: MAJ Investments LLC  
Address: 13 Wheeling Ave, Woburn, Ma 01801  
Phone: 781-935-6100 / 781-718-2005  
Email: [matt@maggiore.com](mailto:matt@maggiore.com)  
Job Site Location : Rear of 1021 Massachusetts Ave, Arlington Ma

From: Bob Moses  
Arbor Tree Service  
11 Spring Ave  
Wakefield, Ma. 01880  
Cell 781-858-2535  
Email [rnmoses1@live.com](mailto:rnmoses1@live.com)

***Scope of Work: Clear Cutting Approximately 8300 Square Feet of Vacant Thickly Overgrown Land.***

- 1) Take Down, Remove and Flush Cut Approximately 100 Large, Medium and Smaller Caliper DBH ( Diameter at Breast Height ) Assorted Specie Deciduous and Conifers.***
- 2) Remove all Previously Storm Damaged Felled Mixed Caliper Trees, Brush and Ground Debris.***

***Job Includes***

- Chip brush and remove
- Remove wood
- Flush Cut Stumps as low as possible.
- Complete cleanup

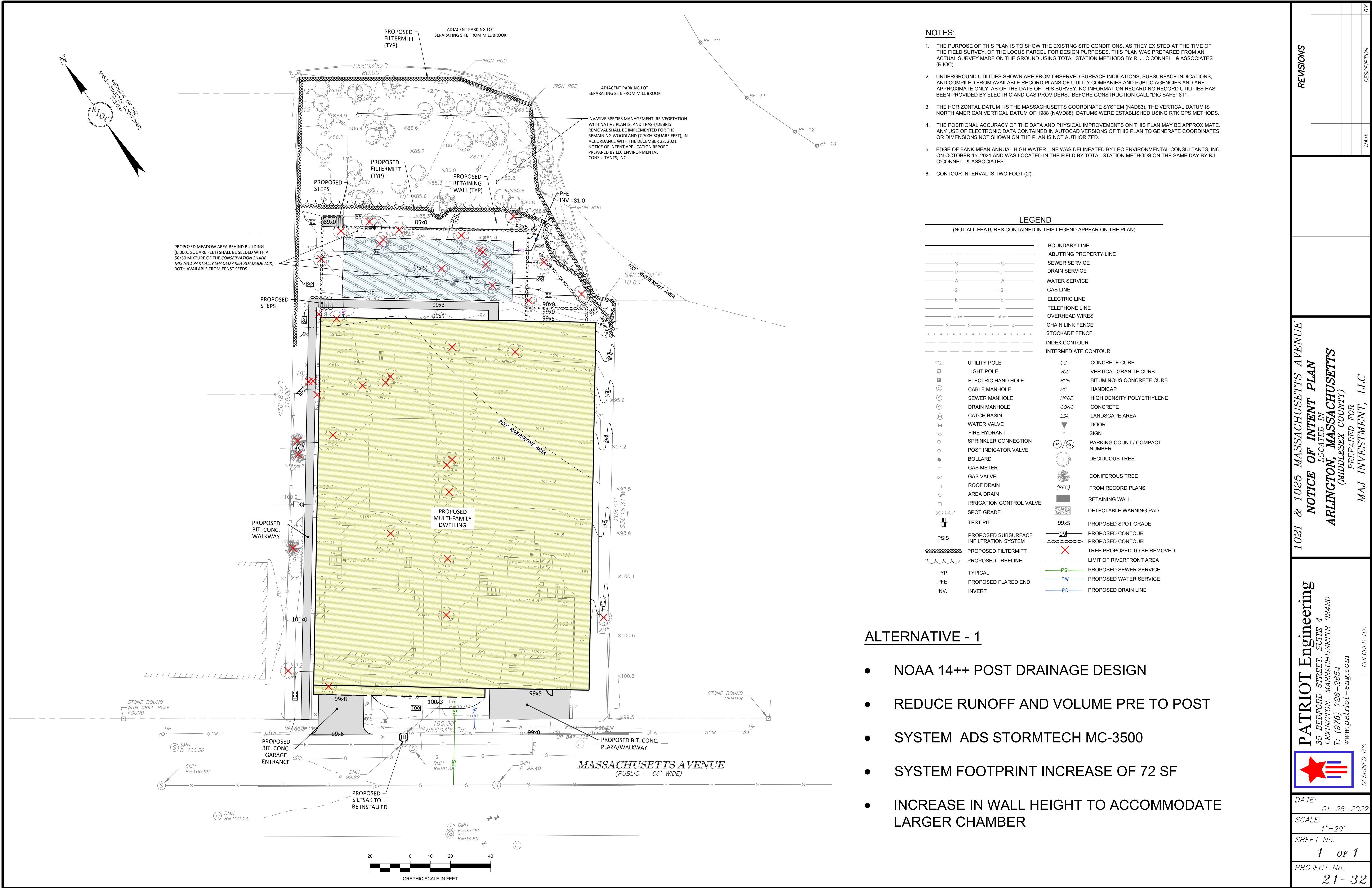
• Total cost of Tree Services \$ 78,500.00

***Additional Information : Stump Removal and Disposal. \$ TBD***

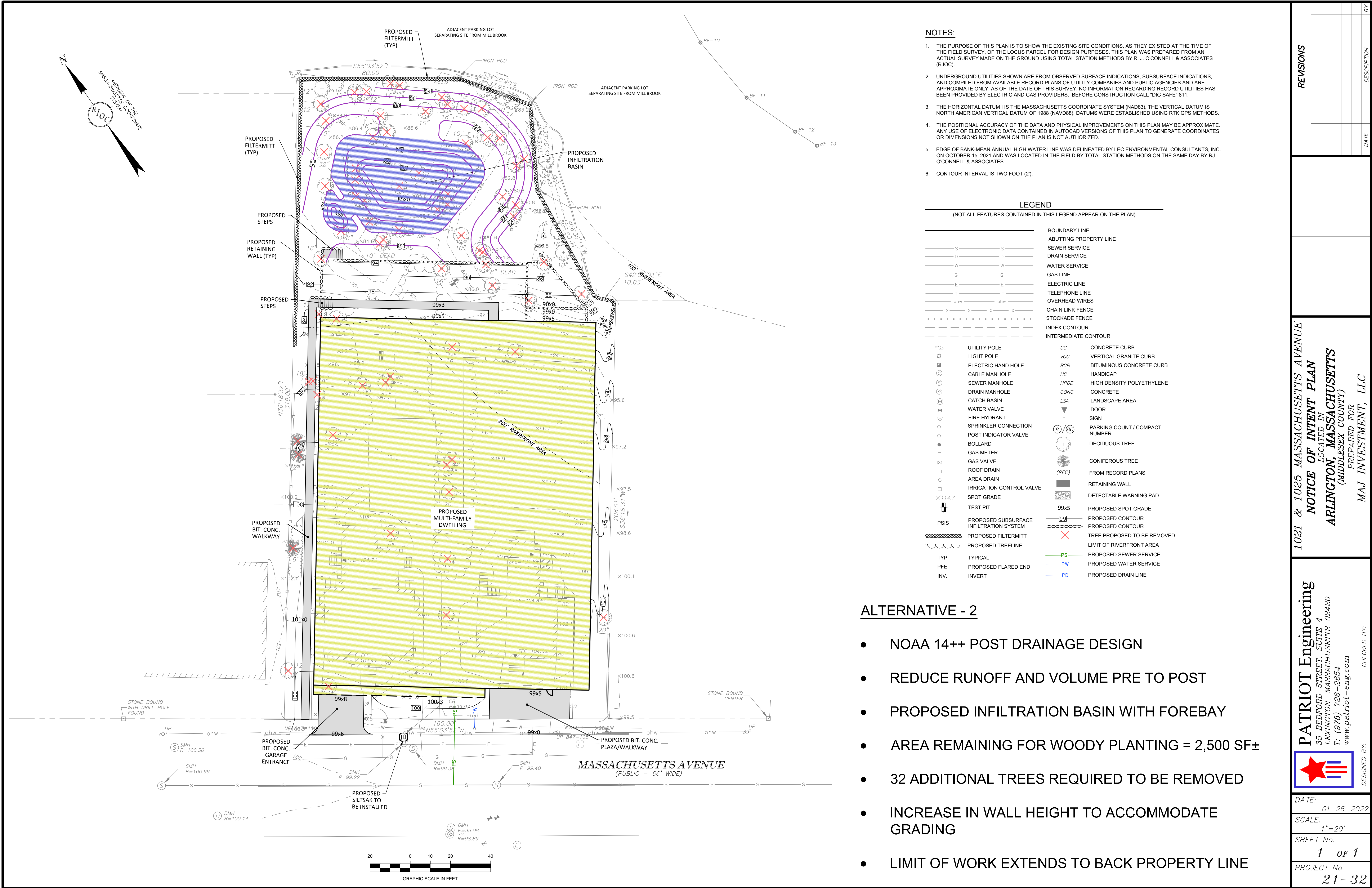
***All Work Performed Must Be Reviewed and Approved By The Local and / or State Conservation Commission Officials.***

Sincerely,  
Bob Moses  
Arbor Tree  
Service Inc.













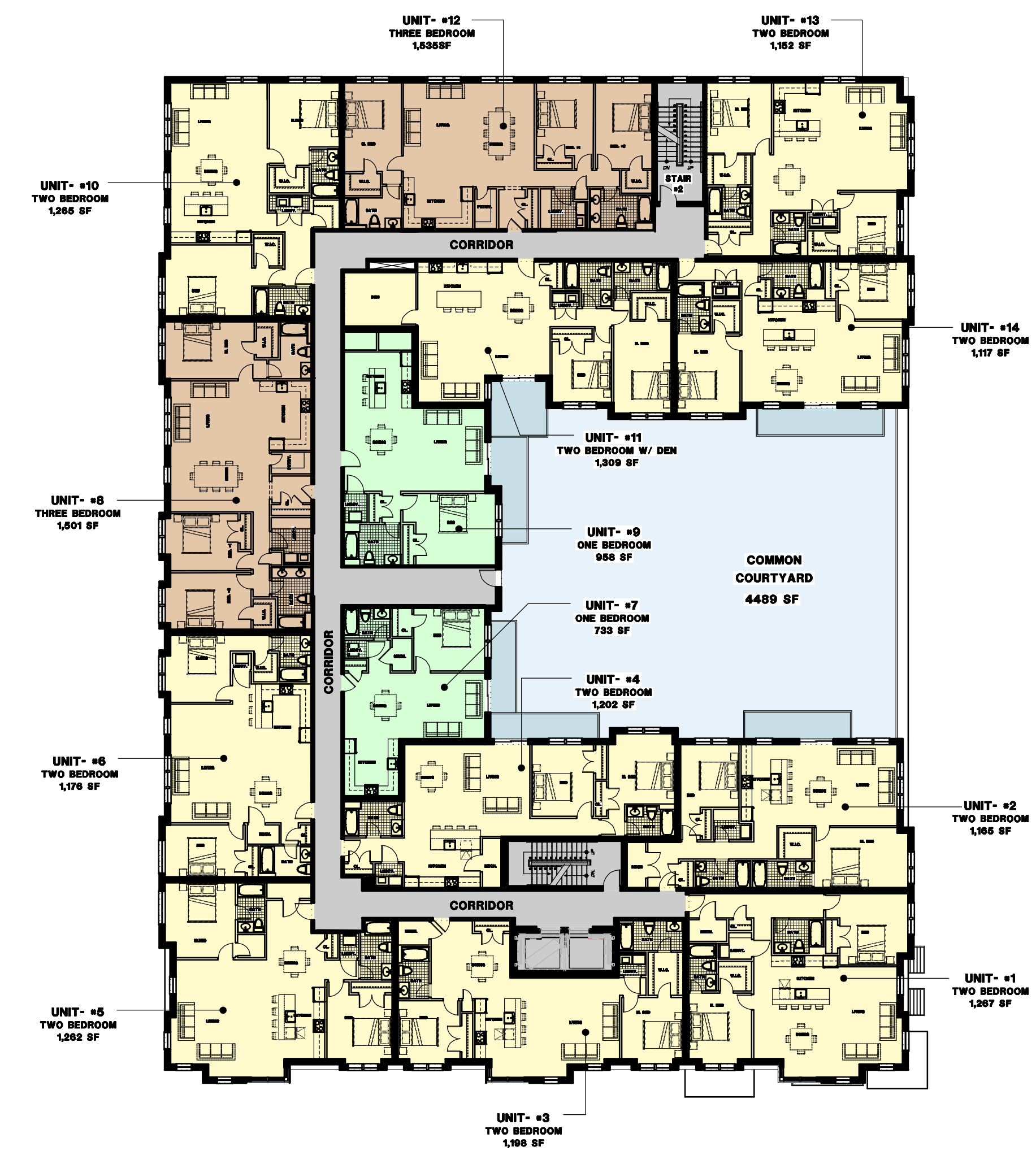




GROUND FLOOR PLAN

0 10 20 40  
SCALE: 1" = 20' - 0"

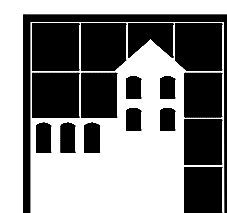
- MIXED USE
- CIRCULATION
- GARAGE
- COMMON SPACE
- UNIT OUTSIDE SPACE
- 1 BEDROOM UNIT
- 2 BEDROOM UNIT
- 3 BEDROOM UNIT
- COMMON OUTSIDE SPACE



14 UNITS  
GROSS AREA - 20,601 S.F.

2nd FLOOR PLAN

0 10 20 40  
SCALE: 1" = 20' - 0"



**HARRISON MULHERN ARCHITECTS**  
611 Main Street  
Winchester, MA 01890  
v. 781-729-3700 f. 781-729-3672  
email: cmulhern@hmarchitects.com

**MASS AVE. CONDOMINIUMS**  
1021-1025 MASSACHUSETTS AVENUE, ARLINGTON MA

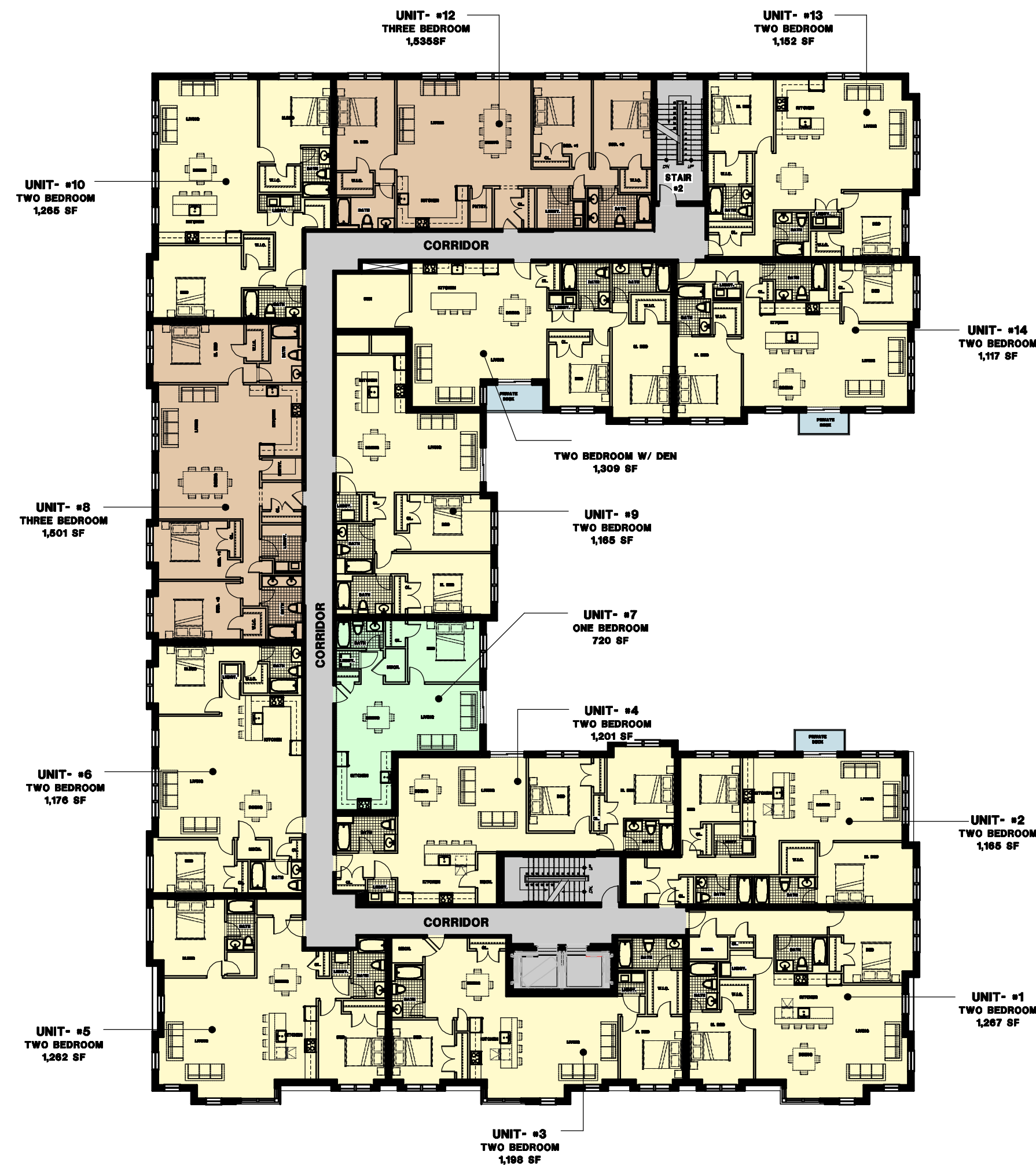
DECEMBER 10, 2021



SHEET #

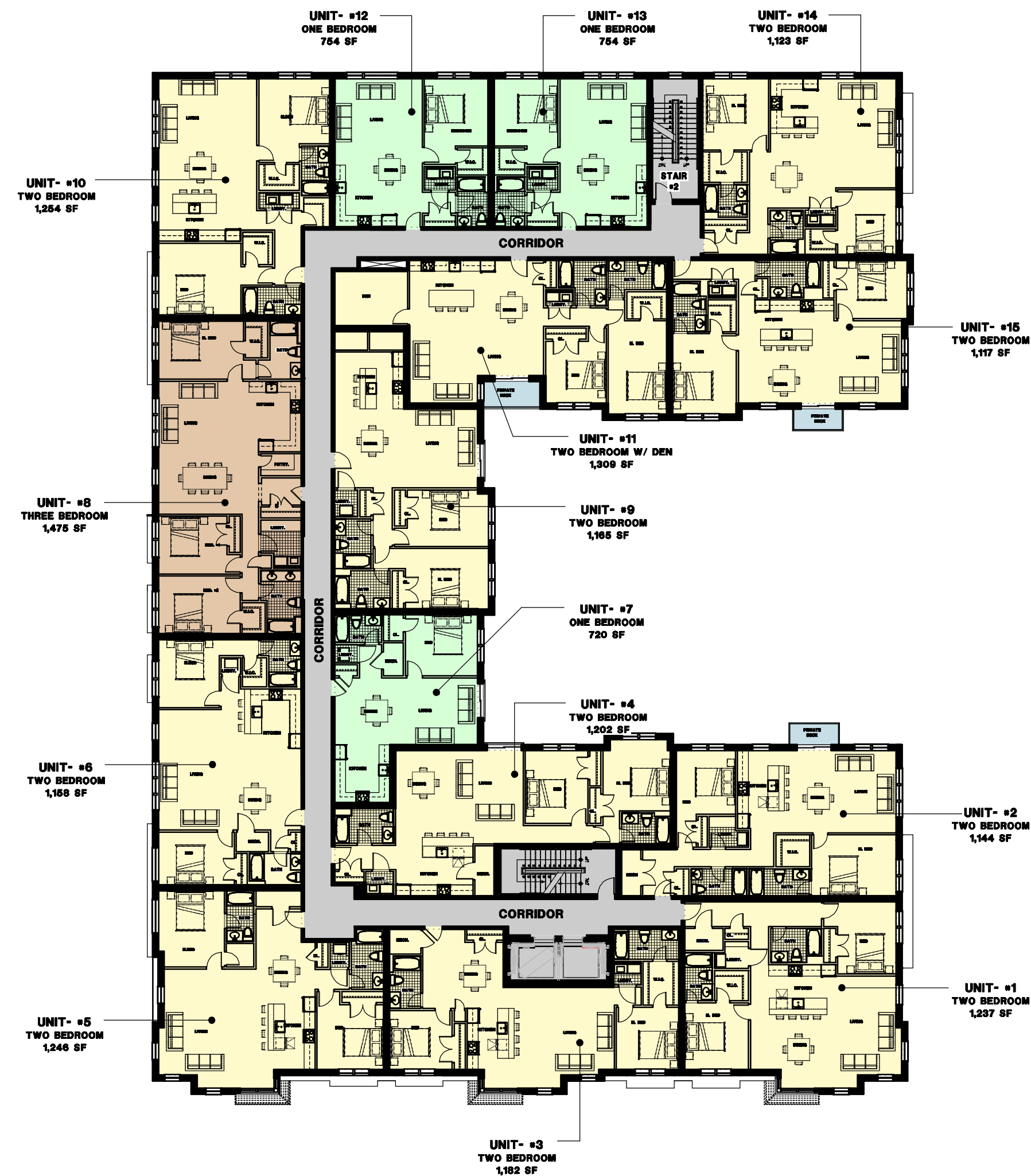
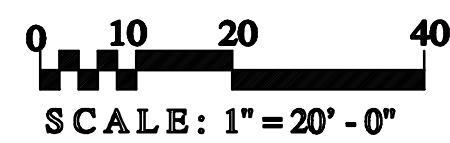
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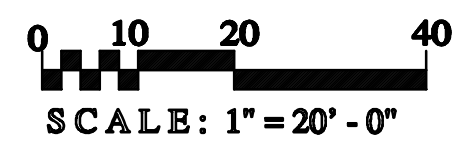
14 UNITS  
GROSS AREA - 20,601 S.F.

3rd FLOOR PLAN

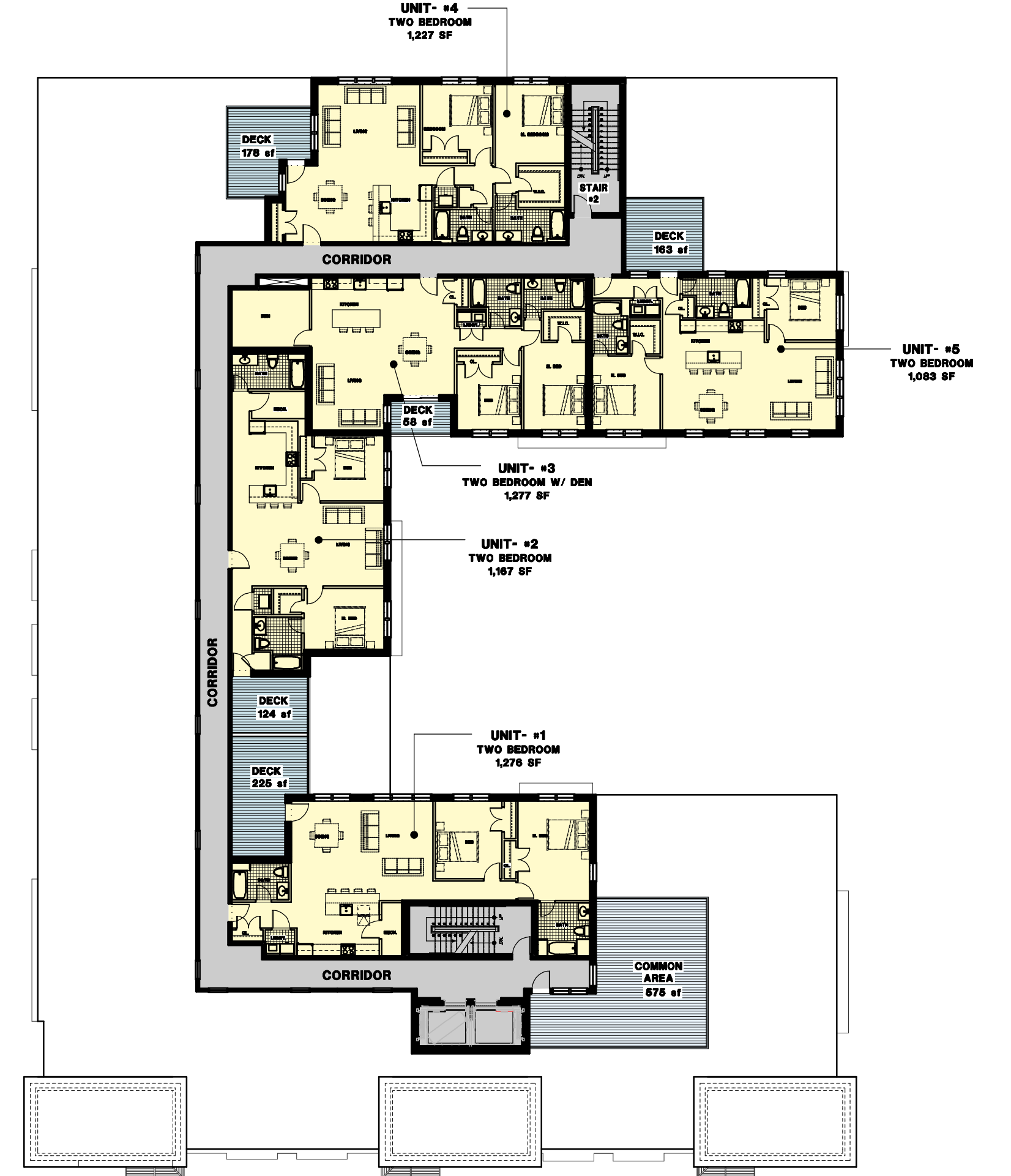


15 UNITS  
GROSS AREA - 20,410 S.F.

4th FLOOR PLAN

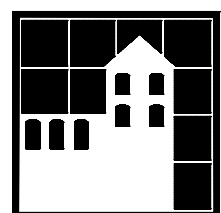
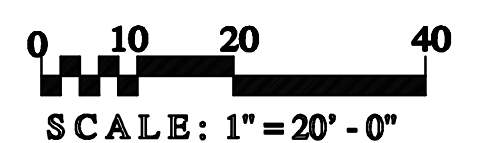


- CIRCULATION
- UNIT OUTSIDE SPACE
- 1 BEDROOM UNIT
- 2 BEDROOM UNIT
- 3 BEDROOM UNIT
- 3 BEDROOM UNIT
- COMMON OUTSIDE SPACE



5 PENTHOUSE UNITS  
GROSS AREA - 8,793 S.F.

5th FLOOR PLAN



**HARRISON MULHERN ARCHITECTS**  
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email: cmulhern@hmarchitects.com

**MASS AVE. CONDOMINIUMS**  
1021-1025 MASSACHUSETTS AVENUE, ARLINGTON MA

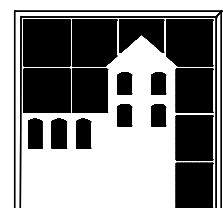
DECEMBER 10, 2021



SHEET #

**A1.2**





**HARRISON MULHERN ARCHITECTS**  
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 Winchester, MA 01890  
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 email: cmulhern@hmarchitects.com

**MASS AVE. CONDOMINIUMS**  
 1021-1025 MASSACHUSETTS AVENUE, ARLINGTON MA

DECEMBER 10, 2021



SHEET #

**A1.3**

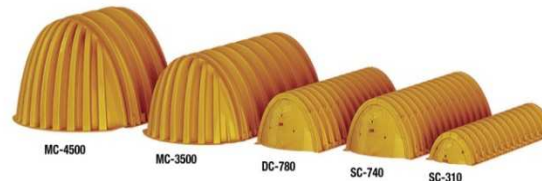




## ***StormTech has never offered Multi-Layered Systems***



- **In our opinion the need for a near perfect installation of stacked systems to prevent a failure makes this a risky design.** StormTech chose to invest in larger chambers and follow proven 3<sup>rd</sup> party engineering design methods and National / International ASTM and AASHTO LRFD Design / Performance Standards.
- **Over a Decade of Successful Performance of the SC-310 and SC-740** inspired us to develop 2 larger chambers (MC-3500 & 4500) to meet the demand for smaller footprints without reducing safety factors.
  - Structural integrity - 2 to 1 safety factors for both live and dead loads
  - Meets Industry Standards – ASTM F2418, F2787 & AASHTO LRFD
  - Injection Molded – Consistent Wall Thickness
  - Reduced Footprint using a proven single layered design
  - True Elliptical Arch Design - Ensures Appropriate Load Distribution Between Plastic and Stone



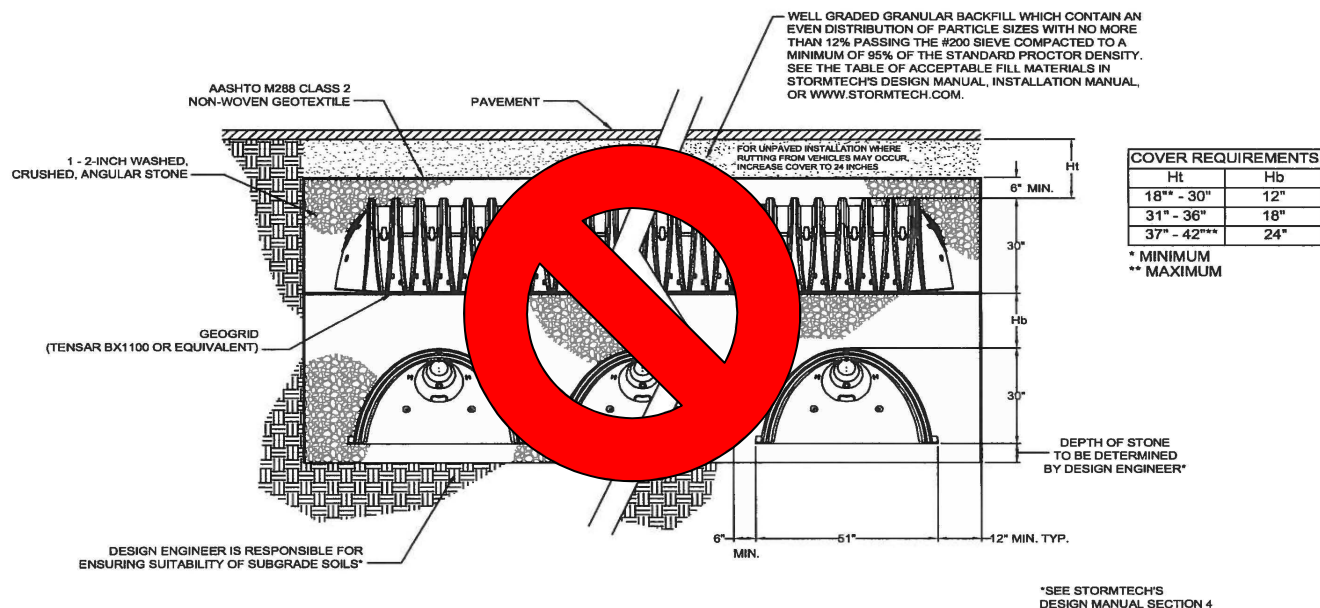
**In our opinion stacked systems are susceptible to failure due to the difficulty of construction.**

Some of the potential difficulties are:

- Compaction of stone layer(s) between tiers damages lower chambers
- Insufficient strength of the stone layer(s) results in concentrated loads
- Construction loads to build the upper layer(s) damage lower



# Conceptual Cross Section of a Typical Multi-layered Chamber System

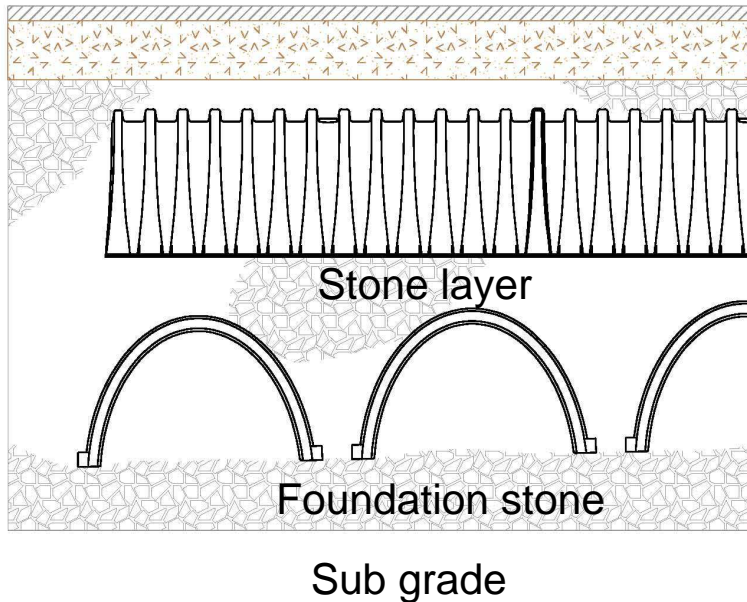


## STORMTECH SC-740 DOUBLE LAYER SYSTEM

- TOP AND BOTTOM ROWS MUST BE PERPENDICULAR
- DOUBLE LAYER SYSTEMS REQUIRE PRE-APPROVAL OF THE DESIGNING ENGINEER AND AN INDEMNITY AGREEMENT SIGNED BY THE PROPERTY OWNER
- VISUAL ACCESS REQUIRED FOR A TOP AND BOTTOM ROW OF CHAMBERS

STORMTECH, INC. P.O. BOX 619 OLD SAYBROOK, CT 06475 888.892.2694 WWW.STORMTECH.COM		STORMTECH SC-740 CHAMBER SYSTEM DOUBLE LAYER DESIGN	
SCALE	NTS	REV.	A
DATE	2/12/2003	ACAD No.	DOUBLE LAYER.DWG
DRAWN BY:	KS	SHEET	1 OF 1





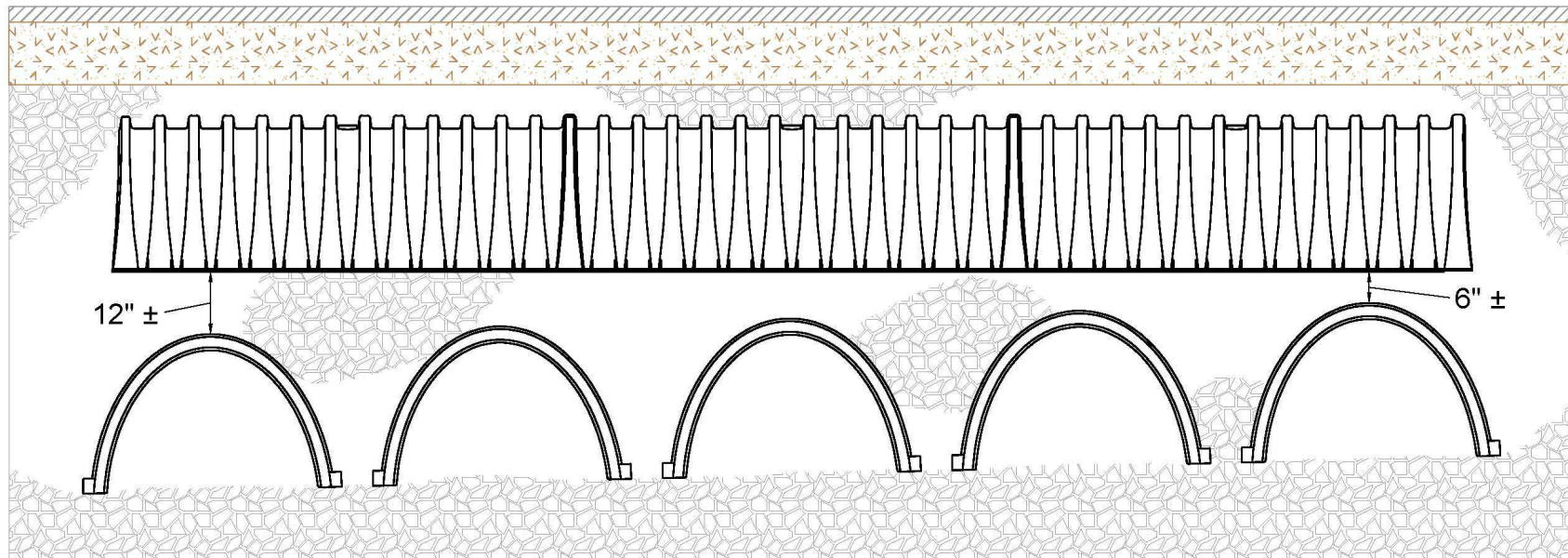
- The stone layer between chamber tiers must be able to support the concentrated loads from the chamber feet above.
- The problem is that the stone layer is not continuously supported like the foundation stone on sub grade
- It may be too thin to compact and develop the strength to support the feet above

***The stone layer is subject to shear failure***

**In the example below the intended stone layer thickness of 12" is not achieved everywhere:**

**Causes?**

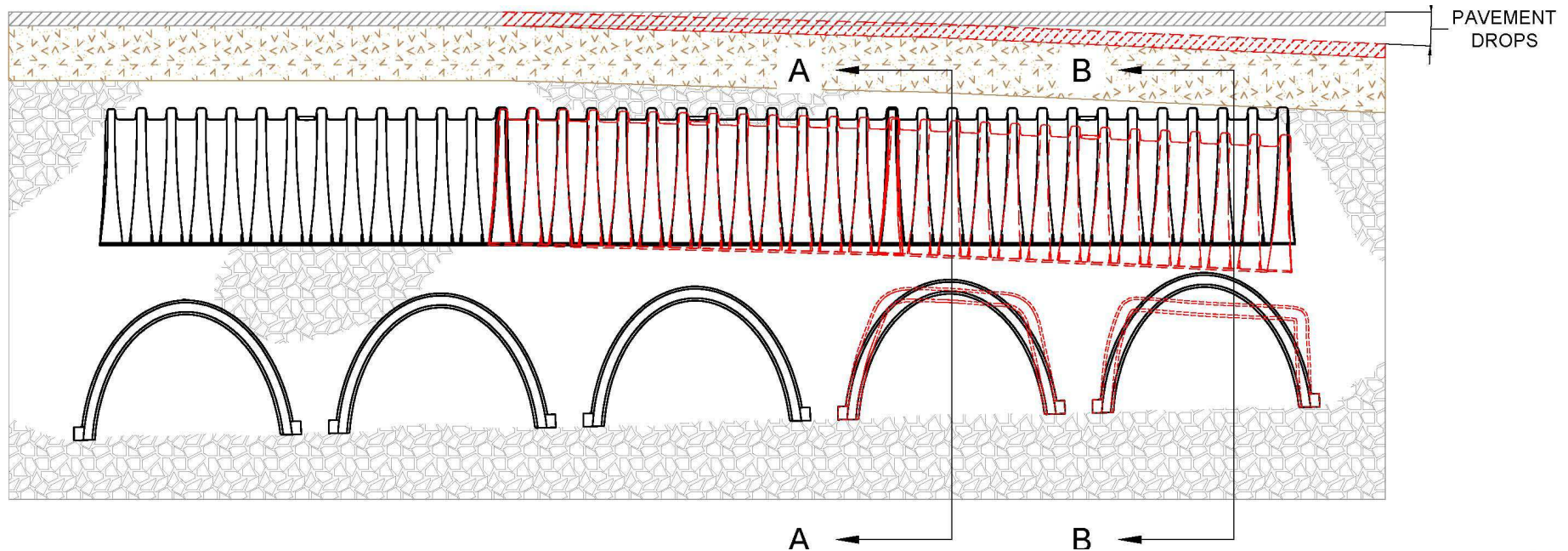
- Sloping sub grade & foundation?
- Random high spots?
- Distorted chambers?



A thin stone layer over chambers is difficult, if not impossible, to compact

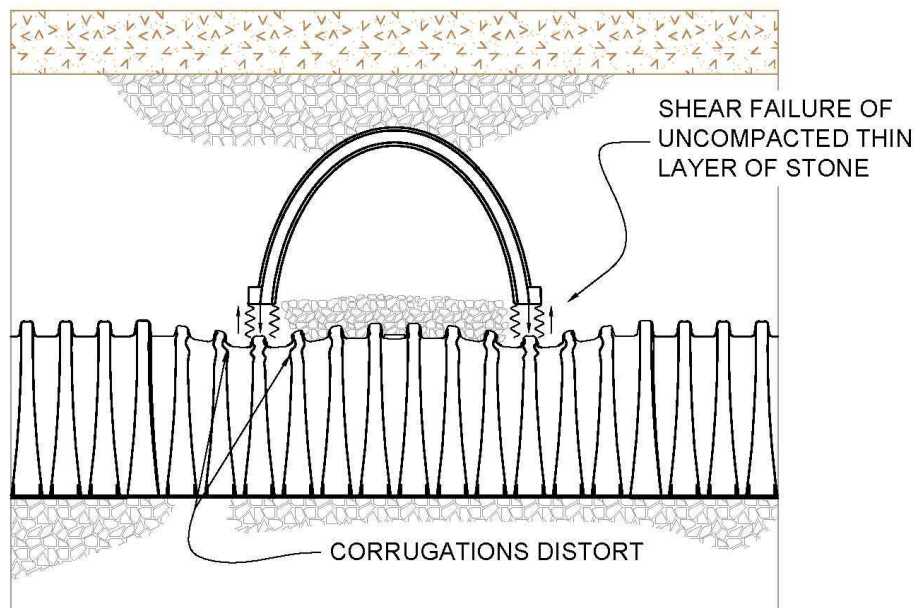
The thin, uncompacted stone layer of 6" to 12" fails in shear and does not spread the load from the feet above.

Chambers under the worst areas crush from concentrated loads

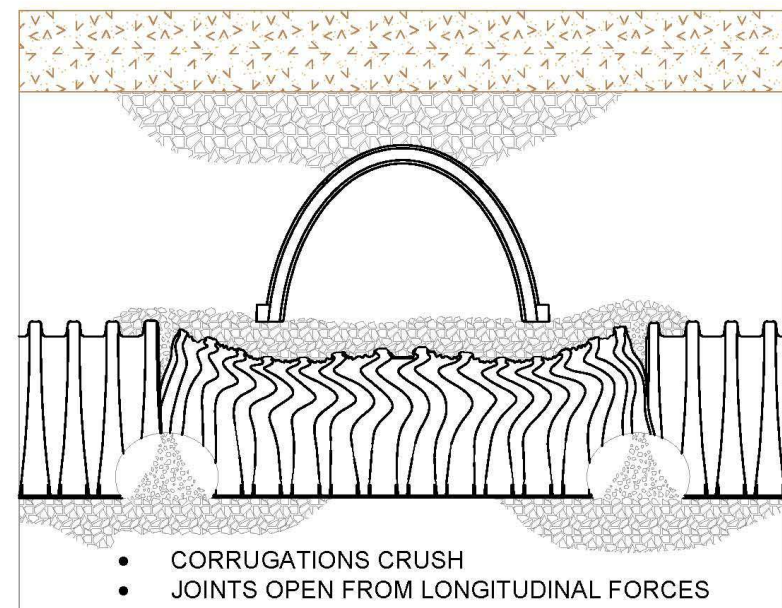




## Progression of shear failure of stone layer to chamber failure



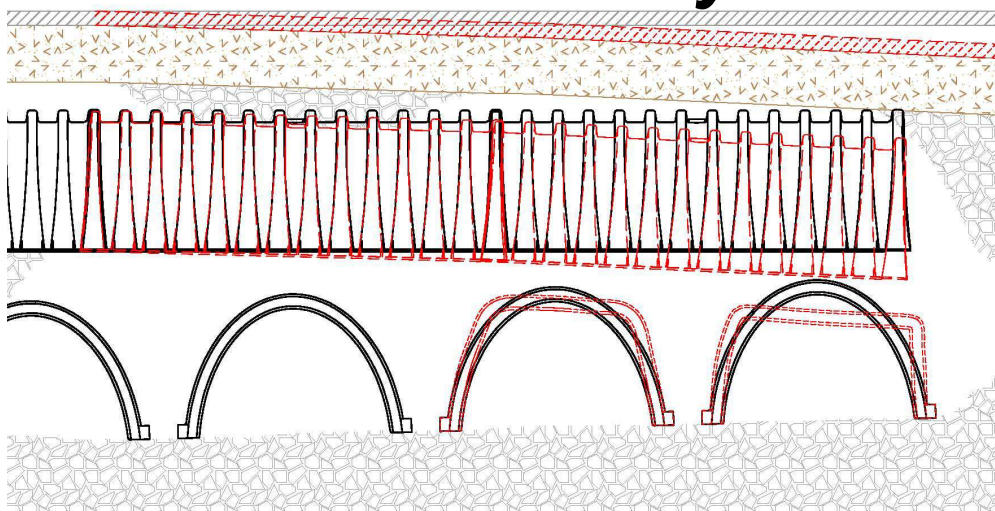
SECTION A-A



SECTION B-B

The need for the right stone, in the right thickness, with the right compaction, without contractor errors make the layered system vulnerable.

***In our opinion there is an unacceptable probability of failure of these systems.***





**From:** [Jacquie Maggiore](#)  
**To:** ["katarina.v.ilic@gmail.com"](mailto:katarina.v.ilic@gmail.com)  
**Cc:** ["cmorse@thayerassociates.com"](mailto:cmorse@thayerassociates.com); [Matt Maggiore](#); [Paul Maggiore](#)  
**Subject:** 1021 & 1025 Massachusetts Avenue  
**Date:** Tuesday, January 11, 2022 4:42:13 PM  
**Attachments:** [Millbrook Letter 1.11.22.pdf](#)  
[image001.png](#)

---

Good afternoon Ms. Ilic,

Attached please find a letter from the Maggiore Companies regarding 1021 & 1025 Massachusetts Avenue.

Thank you,  
Jacquie

—

**Jacquelyn E. Maggiore**  
Director of Real Estate Marketing

**O** 781.935.6100 **M** 781.718.2006  
[jacquie@maggiore.co](mailto:jacquie@maggiore.co)  
[maggiore.co](http://maggiore.co)

13 Wheeling Avenue  
Woburn, MA 01801



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# MAGGIORE

INVEST. DESIGN. BUILD.

Ms. Katarina Ilic  
Millbrook Condominium Association  
993-995 Massachusetts Avenue  
Arlington, MA 02476

November 11, 2022

Dear Ms. Ilic,

As you may recall, we circulated a letter back in August introducing our company and informing our neighbors of our intention to construct a residential condominium project on the parcels located at 1021 & 1025 Massachusetts Avenue.

Over the past several months we have been working through the permitting process. One of the requirements in receiving approval for the project is for us to work with the Conservation Commission to offset the disturbance of the riverfront area by improving other areas along Mill Brook through maintenance and the addition of plantings.

In the January 6th Conservation Commission meeting, it was suggested that we approach the Mill Brook Condominium Board of Trustees and ask permission to improve the landscaped area on the 993-995 Mass Avenue property that abuts Mill Brook and your parking lot. We are aware of the challenges involved in receiving approval to perform work on condominium owned property, as we have developed several condominium projects. That being said, we would appreciate if you would approach the trustees and ask for their consideration on this matter.

We would be pleased to share details and preliminary plans for the work that the Conservation Commission would like us to complete if there is any interest in allowing us to do so.

Please feel free to contact me by email or telephone: (781) 935 -6100.

Kind Regards,



Jacquelyn E. Maggiore



**From:** [Jacquie Maggiore](#)  
**To:** ["katarina.v.ilic@gmail.com"](#)  
**Cc:** ["cmorse@thayerassociates.com"](#); [Matt Maggiore](#); [Paul Maggiore](#)  
**Subject:** RE: 1021 & 1025 Massachusetts Avenue  
**Date:** Thursday, January 20, 2022 9:52:09 AM  
**Attachments:** [Mill Brook Enhancement Planting Sketch prepared by LEC Environmental Co....pdf](#)  
[image001.png](#)

---

Good morning,

I wanted to confirm that you received our letter. Attached is a sketch that indicates the proposed area of enhancement for your review.

In the February 3rd meeting, we are required to inform Con Comm whether or not Mill Brook has any interest in working with us. If you could please respond prior to the 1/27 submittal date, we would greatly appreciate it.

Happy to answer any questions you may have.

Best,  
Jacquie

—

**Jacquelyn E. Maggiore**  
Director of Real Estate Marketing

**O** 781.935.6100 **M** 781.718.2006  
[jacquie@maggiore.co](mailto:jacquie@maggiore.co)  
[maggiore.co](http://maggiore.co)

13 Wheeling Avenue  
Woburn, MA 01801



**Mill Brook Enhancement Planting Sketch** prepared by LEC Environmental Consultants, Inc., for consideration as part of a mitigation strategy for the affordable housing project proposed at 1021-1025 Massachusetts Avenue, Arlington, MA (parcels outlined in red)

Yellow shade represents approximate location of proposed Enhancement Area adjacent to existing parking lot and access drive. This area would be planted with a variety of native shrubs and sapling trees, such as:

Native Trees: Red Maple (*Acer rubrum*), River Birch (*Betula nigra*), gray birch (*Betula populifolia*), tupelo (*Nyssa sylvatica*)

Native Shrubs: Highbush blueberry (*Vaccinium corymbosum*), winterberry holly (*Ilex verticillata*), witch hazel (*Hamamelis virginiana*), silky dogwood (*Cornus amomum*), sweet pepperbush (*Clethra alnifolia*)

LEC estimates that roughly eight (8) native sapling trees and thirty (30) native shrubs could be installed within the Enhancement Area. Native trees and shrubs are locally sourced and measure 4-6' tall (trees) and 2-3' feet tall (shrubs) at the time of planting. Plant stock typically arrives in 1-2 gallon pots and plant installation should require less than 1 day to complete. LEC would monitor the success and vigor of the plantings for two (2) growing seasons following installation and coordinate any required replacement plantings (due to plant mortality during the 2-year monitoring period) with the landscape contractor.

**From:** [Candice Morse](#)  
**To:** [Jacquie Maggiore](#); "[katarina.v.ilic@gmail.com](mailto:katarina.v.ilic@gmail.com)"  
**Cc:** [Matt Maggiore](#); [Paul Maggiore](#)  
**Subject:** RE: 1021 & 1025 Massachusetts Avenue  
**Date:** Thursday, January 20, 2022 6:54:11 PM  
**Attachments:** [image001.png](#)

---

Hi Jacquie,

Your email was received and I will include this on the Trustees' next meeting agenda which is set for 1/27.

*Candice Morse*

Candice Morse, ARM<sup>®</sup>, CPM<sup>®</sup>  
Vice President  
Thayer & Associates, Inc., AMO<sup>®</sup>  
1812 Massachusetts Avenue  
P.O. Box 400196  
Cambridge, MA 02140  
Phone: 617-354-6480/ Fax: 617-354-7854  
E-Mail: [cmorse@thayerassociates.com](mailto:cmorse@thayerassociates.com)

---

**From:** Jacquie Maggiore [mailto:[jacquie@maggiore.co](mailto:jacquie@maggiore.co)]  
**Sent:** Thursday, January 20, 2022 9:52 AM  
**To:** 'katarina.v.ilic@gmail.com' <[katarina.v.ilic@gmail.com](mailto:katarina.v.ilic@gmail.com)>  
**Cc:** Candice Morse <[cmorse@thayerassociates.com](mailto:cmorse@thayerassociates.com)>; Matt Maggiore <[matt@maggiore.co](mailto:matt@maggiore.co)>; Paul Maggiore <[paul@maggiore.co](mailto:paul@maggiore.co)>  
**Subject:** RE: 1021 & 1025 Massachusetts Avenue

Good morning,

I wanted to confirm that you received our letter. Attached is a sketch that indicates the proposed area of enhancement for your review.

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Happy to answer any questions you may have.